



**Huntington Power Plant**

*6 miles west of Huntington, Utah on Hwy. 31*

*P.O. Box 680*

*Huntington, Utah 84528*

July 21, 2016

Mr. Bryce Bird, Director  
Utah Department of Environmental Quality  
Division of Air Quality  
195 North 1950 West  
P. O. Box 144820  
Salt Lake City, Utah 84114-4820

Attn: Mr. Norm Erikson

RE: 2016 Unit 1 RATA Report

Dear Mr. Bird,

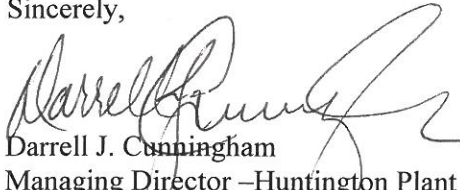
The Annual Source Emission Test Reports, or Relative Accuracy Test Audits (RATAs) of the Continuous Emissions Monitoring Systems (CEMs) in service at the PacifiCorp Huntington Plant Unit 1 have been completed per the specifications found in 40 CFR Part 60 and 75. The mid-, and high-load Flow RATAs, along with the Gas and Mercury RATAs were conducted June 29, 2016 on Unit 1.

Enclosed is the RATA report for the Huntington Plant Unit 1 Flow, Gas, and Mercury CEMs.

I am authorized to make this submission on behalf of the owners and operators of the affected source or affected units for which the submission is made. I certify under penalty of the law that I have personally examined, and am familiar with, the statements and information submitted in this document and its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment.

Should you have any questions or concerns, please contact Richard Neilson at (435) 687-4334.

Sincerely,

  
Darrell J. Cunningham  
Managing Director -Huntington Plant  
Responsible Official

Enclosures: "Emissions Testing Report for PacifiCorp Huntington Unit 1"

cc: Director - EPA Region VIII w/enclosure  
Richard Neilson – Huntington Plant w/ enclosures  
Dave Barnhisel – NTO w/o enclosures  
Frank Zampedri – NTO w/o enclosures



Emissions Testing Report for  
PacifiCorp  
Huntington Unit 1  
Huntington, Utah

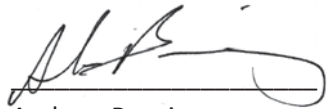
Test Dates: June 28 & 29, 2016

Project Code PC16-0031

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## Certification Statement

I certify that all field data were acquired under my direction in accordance with a system designed to assure data quality. Based on reasonable inquiry, the information submitted is to the best of my knowledge true, accurate and complete.



Andrew Bruning  
Senior Project Manager  
Emissions Measurement Company

I certify that this document and all attachments were prepared under my direction in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on reasonable inquiry, the information submitted is to the best of my knowledge true, accurate and complete.



Matthew Parks  
Technical Director  
Emissions Measurement Company

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## **Introduction**

EMCo was contracted by PacifiCorp to conduct source testing services at the Huntington Power Plant near Huntington, Utah. The Huntington Plant comprises two pulverized coal-fired boilers, each equipped with low-NO<sub>x</sub> burners and overfire air for nitrogen oxides (NO<sub>x</sub>) control, a flue gas desulfurization (FGD) scrubber for sulfur dioxide (SO<sub>2</sub>) control and pulse-jet fabric filters for PM control. In accordance with Utah Department of Environmental Quality (UDEQ) Operating Permit 1501001004, the Unit #1 exhaust stack is equipped with Continuous Emission Monitoring Systems (CEMS) to quantify carbon dioxide (CO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>) emissions. Each unit is also equipped with a CEMS to quantify mercury (Hg) emissions. Unit #1 is also equipped with a CEMS to quantify carbon monoxide (CO) emissions. Monitoring system information is given in the table below.

Monitor Location	Parameter	Monitor Make /Model	Part 75 Monitor ID
Huntington Unit 1	Flow	Teledyne Monitor Labs Model 150	105
	CO <sub>2</sub>	Thermo Fisher Model 410i	113
	SO <sub>2</sub>	Thermo Fisher Model 43i	111
	NO <sub>x</sub>	Thermo Fisher Model 42i	112
	CO	Thermo Fisher Model 48i	—
	Hg	Thermo Fisher Model 80i	—

Testing was conducted to satisfy state and federal quality assurance requirements. Contact information for the project is listed in the table below.

Contact	Affiliation	Telephone	E-mail
Frank Zampedri Environmental Analyst	PacifiCorp	(801) 220-2169	frank.zampedri@pacificorp.com
Richard Neilson Environmental Engineer	PacifiCorp	(435) 687-4334	richard.neilson@pacificorp.com
Norm Erikson Environmental Scientist	UDEQ	(801) 536-4063	nerikson@utah.gov
Andrew Bruning Senior Project Manager	EMCo	(303) 810-2168	abruning@stacktest.us

### **Scope of Work**

Relative accuracy test audits (RATAs) were performed in accordance with 40 CFR Part 75 on the Unit #1 Exhaust CEMS. RATA testing was performed at high load to determine the relative accuracy of the Volumetric Flow Rate, CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>x</sub> and Hg CEMS in accordance with the annual RATA requirements of 40 CFR Part 75 Appendix B, §2.3.1.2(a). Volumetric Flow Rate RATA testing was also performed at mid load. RATA testing was also performed in accordance with 40 CFR Part 60 on the Unit #1 SO<sub>2</sub>, NO<sub>x</sub> and CO CEMS. The details of each test are given in the table below.

Source	Location	Regulation	Test Type	Load Level*	Parameter(s)
Huntington Unit 1	Outlet	40 CFR Part 75	RATA	High	Hg (µg/wscm)
*High Load is defined as 408-520 MWg at Unit #1, and Mid Load is defined as 324-408 MWg.					
Abbreviations: µg/wscm: micrograms per wet standard cubic meter					

### **Testing Methods**

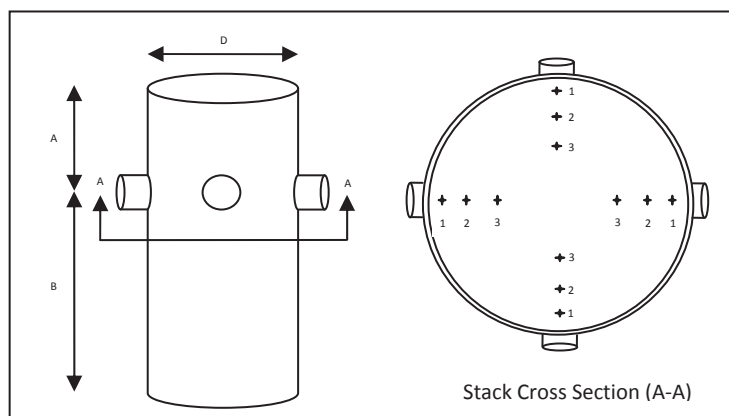
EMCo used the following EPA Reference Methods for the testing program. No deviations from the Reference Methods were noted. All RATAs consisted of at least nine test runs.

Source	Parameter	EPA Reference Methods	Test Runs/Duration
Huntington Unit 1	Hg (µg/wscm)	30B	9 @ 60 minutes

### Testing Location

The Huntington Unit 1 exhaust sampling location consists of a vertical, circular stack with an interior diameter of 323.3 inches and four orthogonal sampling ports located 9.9 diameters downstream and 8.2 diameters upstream of the nearest flow disturbances.

Prior to commencing the RATA, pollutant gas stratification testing was performed across a grid of 12 points determined using EPA Method 1 in accordance with 40 CFR Part 60, Appendix B, PS2 §8.1.3.2 and 40 CFR Part 75, Appendix A, §6.5.6.1. Stratification testing was performed for two minutes per traverse point in accordance with 40 CFR Part 75, Appendix A, §6.5.6.1(c). As diluent (CO<sub>2</sub>) and pollutant (NO<sub>x</sub> or SO<sub>2</sub>) concentrations were within 5% of their mean concentrations, mercury RATA testing was performed at a single point in the stack as allowed by §8.1.3.5 of Method 30A. See the schematic below.



Stratification Test Diagram	
Unit #	1
Diameter (D)	323.3"
Upstream Distance (A)	>220'
Downstream Distance (B)	>266'
Sample Point Distances from Stack Wall	
Traverse Point 1	14.1"
Traverse Point 2	47.3"
Traverse Point 3	95.7"

### Test Results

The results of the testing program are given in the tables below. Detailed test results are located in Appendix A, along with sample calculations for all computed values.

<b>PacifiCorp</b> <b>Huntington Unit 1</b> <b>RATA Results Summary (6/29/2016)</b> <b>High Load (480 MW)</b>								
Run #	Start Time	Stop Time	Hg (µg/wscm)			Hg (lb/TBtu)		
			RM	CEM	Difference	RM	CEM	Difference
1	9:05	10:05	0.031	0.323	-0.292	0.032	0.331	-0.299
2	10:13	11:13	0.027	0.205	-0.178	0.028	0.209	-0.181
3	11:18	12:18	0.020	0.204	-0.184	0.021	0.212	-0.191
4	5:51	6:51	0.021	0.158	-0.137	0.022	0.165	-0.143
5	6:54	7:54	0.025	0.142	-0.117	0.026	0.147	-0.121
6	7:59	8:59	0.021	0.147	-0.126	0.022	0.155	-0.133
7	9:02	10:02	0.020	0.146	-0.126	0.021	0.153	-0.132
8	10:05	11:05	0.020	0.161	-0.141	0.021	0.170	-0.149
9	11:08	12:08	0.030	0.154	-0.124	0.032	0.164	-0.132
Average			0.024	0.182	-0.158	0.025	0.190	-0.165
Relative Accuracy ( RMavg-CEMavg + CC ) = 0.2						n/a		
40 CFR Part 63 Limit ( RMavg-CEMavg + CC ) ≤ 0.5						n/a		

### **Testing Equipment**

All testing equipment was housed in a climate-controlled mobile analytical laboratory custom-designed and built by EMCo. All required quality assurance tests were performed as required by the applicable Reference Methods. Detailed equipment descriptions are given in the table below.

Parameter	Equipment	EPA Reference Methods
Exhaust Gas Moisture Content (H <sub>2</sub> O)	Chilled Impinger Train Dry gas meter Gravimetric analysis	4
Mercury (Hg)	Heated probe Sorbent traps Dry gas meters Ohio Lumex 915+ Mercury Analyzer	30B

### **Method 30B Quality Assurance**

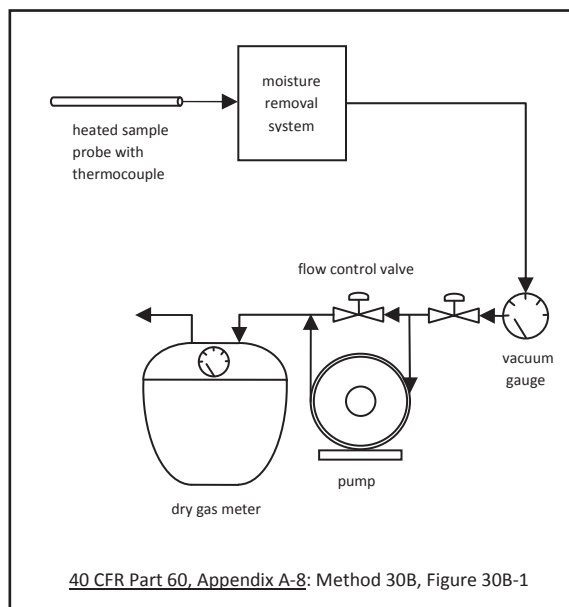
All on-site mercury analysis was performed by a certified Ohio-Lumex operator (see Appendix E). All QA/QC tests were performed as required by Method 30B. Prior to sampling, the Ohio Lumex RA-915+ was calibrated using certified aqueous mercury standards of 5, 10, 50, 100 and 500 nanograms (ng) to create a second-order calibration curve. NIST certificates for the calibration standards are included in Appendix E. Following initial calibration, the calibration curve was challenged with one Independent Calibration Standard of 500 ng. In cases where the observed mercury sample mass was less than the lowest point on the calibration curve (5 ng), mercury masses were calculated using a low-level response factor in accordance with §11.3 of Method 30B. Continuing Calibration Verification Standards (CCVSs) were analyzed following three test runs at each stack. Sorbent tubes spiked with 50 ng of elemental mercury were used on three RATA runs at each stack to fulfill the requirement for Field Spike Recovery tests; as required by Method 30B, spike recovery was calculated as the average of three runs. QA/QC results are summarized in the table below. Detailed analytical results are appended in Appendix A of this report.

Method 30B QA Test	Acceptance Criteria	Actual Value (Unit 1)
Spectrometer Multipoint Calibration	Each calibration point within $\pm 10\%$ of actual value	Maximum = 8.0%
	Calibration Curve $R^2 \geq 0.99$	$R^2 = 1.00$
Independent Calibration Standard	Within $\pm 10\%$ of actual value	Difference = 2.6%
Continuing Calibration Verification Standard (CCVS)	Within $\pm 10\%$ of actual	Maximum = 4.1%
Paired Trap Agreement	Relative Deviation $\leq 20\%$	Maximum RD = 9.9%
Field Spike Recovery	$85\% \leq \text{Average} \leq 115\%$	Average = 100%



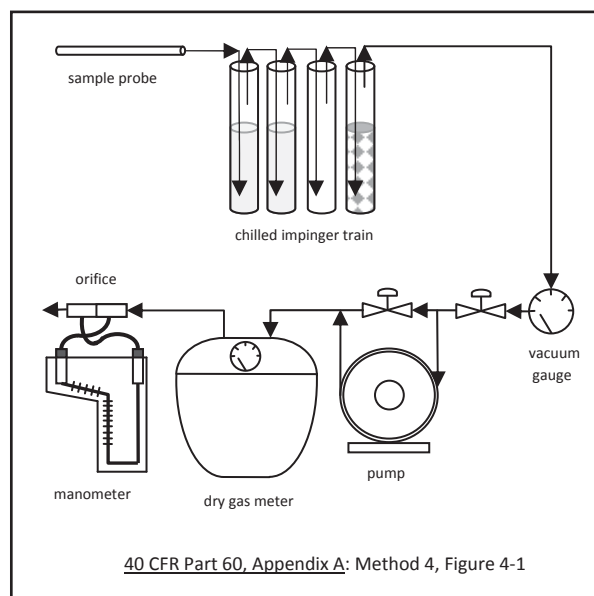
### Test Details

Mercury testing was performed using EPA Method 30B. Test run duration was determined in accordance with Section 8.2.5 of Method 30B as a function of minimum sample mass, target sample volume and sample flow rate. Each test run consisted of withdrawing samples of stack gas through paired sorbent tubes, through heated stainless steel probes, through paired moisture removal systems, and through dual calibrated dry gas meters. Following each test run, the sorbent traps were removed from the sample probes, capped to avoid media loss or contamination, and transported to EMCo's mobile laboratory for analysis. Samples were analyzed in accordance with EPA Method 30B using an Ohio Lumex RA-915+ differential atomic absorption spectrometer. All Quality Assurance requirements of Method 30B were strictly followed. At each stack, three spiked sorbent traps were analyzed on-site in accordance with Section 8.2.6 of Method 30B. Following analysis, the Relative Deviation of the mercury masses from each paired sample were evaluated for acceptability. The mercury mass from each trap was combined with the corresponding volume of stack gas for the test run, corrected for stack gas moisture content (determined during each run using EPA Method 4; see below), and reported as micrograms of mercury per wet standard cubic meter ( $\mu\text{g}/\text{wscm}$ ). Mercury concentrations were compared to CEMS data from the sampling period to determine the relative accuracy of the CEMS.



Stack gas moisture content was determined in accordance with EPA Method 4. Method 4 sample runs were performed at each unit to confirm saturated conditions. A sample of exhaust gas was withdrawn from the outlet at a constant flow rate, transported through a stainless steel probe, through a series of chilled glass impingers containing known masses of water or silica gel, and through a calibrated dry gas meter. (See Figure 4-1 at right.) The mass of condensed moisture was determined gravimetrically following each run, and combined with the volume of gas collected to calculate stack gas moisture content.

Measured moisture content was above saturation for each test run. Calculated saturated moisture content was used to correct all mercury and flow RATA runs.



**Appended Information**

Supporting data for this testing program are included as follows.

- Data Reduction Spreadsheets
- Sample Calculations
- Field Datasheets
- CEMS Data
- Mercury Calibration Standard Certificates
- Dry Gas Meter Pre-Test and Post-Test Calibrations
- Reference Meter Calibration Certificate
- AETB Certification



**Project PC16-0031**

**Appendix C: Mercury Testing**

Data Reduction Spreadsheets

Sample Calculations

Field Datasheets

CEMS Data

Mercury Calibration Standard Certificates

Dry Gas Meter Pre-Test and Post-Test Calibrations

Reference Meter Calibration Certificate

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Parameter: Hg (µg/wscm)

Run #	Start Time	End Time	Load	RM	CEM	Difference	Used?
1	9:05	10:05	477	0.031	0.323	-0.292	x
2	10:13	11:13	478	0.027	0.205	-0.178	x
3	11:18	12:18	476	0.020	0.204	-0.184	x
4	5:51	6:51	481	0.021	0.158	-0.137	x
5	6:54	7:54	482	0.025	0.142	-0.117	x
6	7:59	8:59	482	0.021	0.147	-0.126	x
7	9:02	10:02	483	0.020	0.146	-0.126	x
8	10:05	11:05	480	0.020	0.161	-0.141	x
9	11:08	12:08	481	0.030	0.154	-0.124	x
10							
11							
12							
Average			480	0.024	0.182	-0.158	

#### RATA Results

Number of Runs:	9
T-value	2.306
Standard Deviation	0.056
Confidence Coefficient	0.043
Relative Accuracy (%RM)	841.39%

#### Limits

20% or ± 0.5 µg/wscm

Parameter: Hg (lb/TBtu)

Fc = 1800

Run #	Start Time	End Time	Load	RM	RM	RM	CEM	Difference		Used?
				Hg	CO <sub>2</sub>	Hg	Hg	Hg	Hg	
				(µg/wscm)	(%vw)	(lb/Tbtu)	(lb/Tbtu)	(lb/Tbtu)	(lb/Tbtu)	
1	9:05	10:05	477	0.031	11.0	0.032	0.331	-0.299		x
2	10:13	11:13	478	0.027	11.0	0.028	0.209	-0.181		x
3	11:18	12:18	476	0.020	10.8	0.021	0.212	-0.191		x
4	5:51	6:51	481	0.021	10.7	0.022	0.165	-0.143		x
5	6:54	7:54	482	0.025	10.8	0.026	0.147	-0.121		x
6	7:59	8:59	482	0.021	10.6	0.022	0.155	-0.133		x
7	9:02	10:02	483	0.020	10.7	0.021	0.153	-0.132		x
8	10:05	11:05	480	0.020	10.6	0.021	0.170	-0.149		x
9	11:08	12:08	481	0.030	10.5	0.032	0.164	-0.132		x
10										
11										
12										
Average			480	0.024	10.7	0.025	0.190	-0.165		

#### RATA Results

Number of Runs:	9
T-value	2.306
Standard Deviation	0.056
Confidence Coefficient	0.043
Relative Accuracy (%RM)	868.5%

EPA Method 30B §11.1: Calibration

Hg Mass (ng)	Area Counts	Calculated Hg Mass (ng)	% Difference
5	1250	4.7	5.2%
10	2370	10.5	4.9%
50	9980	49.6	0.8%
100	19800	100.2	0.2%
500	96500	500.0	0.0%

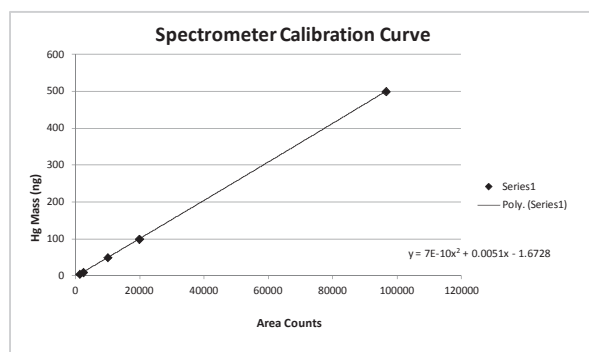
<b>Polynomial Regression</b>	<b>Low-Level Response Factor</b>
Curve: $y = 7.12E-10x^2 + 0.0051x - 1.6728$	Hg Mass (ng) = 2.5
$A_2 = 7.12E-10$	Area Counts = 474
$A_1 = 0.0051$	Response Factor = 189.6
$B = -1.6728$	
$R^2 = 1.00$	

EPA Method 30B §11.1: Independent Calibration Standard

Expected Value (ng)	500
Area Counts	95800
Measured Value (ng)	496.3
% Difference	0.7%
Limit	10%

EPA Method 30B §11.4: Continuing Calibration Verification Standard

Run #	Expected Value (ng)	Area Counts	Measured Value (ng)	% Difference
3	500	92600	479.5	4.1%



EPA Method 30B Sample Analysis

Sample ID	1a	1b	2a	2b	3a	3b
<b>Inputs</b>						
Area Counts (Section 1)	437	502	439	367	290	297
Area Counts (Section 2)	79	21	-8	148	-70	28
Spike Mass (ng)	0	0	0	0	0	0
<b>Calculations</b>						
Section 1 Hg Mass (ng)	2.3	2.6	2.3	1.9	1.5	1.6
Section 2 Hg Mass (ng)	0.0	0.0	0.0	0.0	0.0	0.0
Total Hg Mass less Spike (ng)	2.3	2.6	2.3	1.9	1.5	1.6
Breakthrough (%)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Volume of Sample (dscm)	0.070	0.070	0.069	0.069	0.069	0.069
Hg Concentration (µg/dscm)	0.03	0.04	0.03	0.03	0.02	0.02
Relative Deviation (%)	7.0%		8.8%		1.4%	
Measured Spike Concentration (µg/dscm)	n/a		n/a		n/a	
Spike Recovery (%)	n/a	n/a	n/a	n/a	n/a	n/a
Moisture Concentration (%/100)	0.117	0.117	0.128	0.128	0.120	0.120
Corrected Hg Concentration (µg/wscm)	0.03	0.03	0.03	0.02	0.02	0.02

Average Spike Recovery (%) n/a (85-115%)  
Average Hg Concentration >1 µg/dscm? N  
Breakthrough Limit = 20%  
Relative Deviation Limit = 20%

**EPA Method 30B §11.1: Calibration**

<u>Hg Mass (ng)</u>	<u>Area Counts</u>	<u>Calculated Hg Mass (ng)</u>	<u>% Difference</u>
5	944	5.0	0.4%
10	2020	10.8	8.0%
50	9040	48.5	3.0%
100	18800	100.7	0.7%
500	94400	500.0	0.0%

**Polynomial Regression**

Curve:  $y = -8.40E-10x^2 + 0.0054x + -0.0569$

$A_2 = -8.40E-10$

$A_1 = 0.0054$

$B = -0.0569$

$R^2 = 1.00$

**Low-Level Response Factor**

Hg Mass (ng) = 2.5

Area Counts = 451

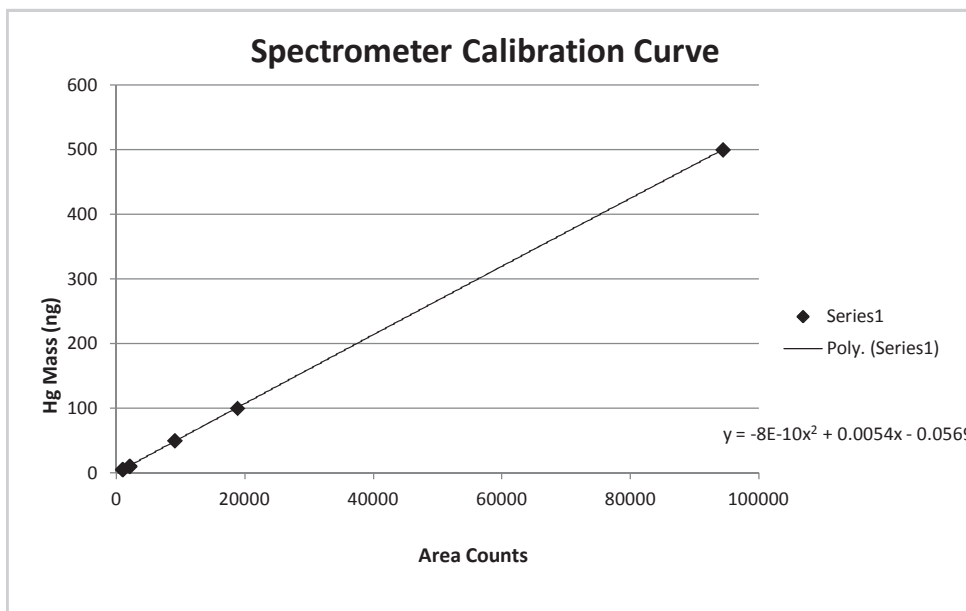
Response Factor = 180.4

**EPA Method 30B §11.1: Independent Calibration Standard**

Expected Value (ng)	500
Area Counts	96900
Measured Value (ng)	513.0
% Difference	2.6%
Limit	10%

**EPA Method 30B §11.4: Continuing Calibration Verification Standard**

<u>Run #</u>	<u>Expected Value (ng)</u>	<u>Area Counts</u>	<u>Measured Value (ng)</u>	<u>% Difference</u>
6	500	92500	490.1	2.0%
9	500	97800	517.7	3.5%



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EPA Method 30B Sample Analysis

Sample ID	4a	4b	5a	5b	6a	6b	7a	7b	8a	8b	9a	9b
<b>Inputs</b>												
Area Counts (Section 1)	245	236	392	289	298	191	9560	218	9610	237	9650	285
Area Counts (Section 2)	86	72	12	60	50	96	82	63	20	59	135	135
Spike Mass (ng)	0	0	0	0	0	0	50	0	50	0	50	0
<b>Calculations</b>												
Section 1 Hg Mass (ng)	1.4	1.3	2.2	1.6	1.7	1.1	51.3	1.2	51.5	1.3	51.7	1.6
Section 2 Hg Mass (ng)	0.4	0.3	0.0	0.3	0.2	0.5	0.4	0.3	0.1	0.3	0.7	0.7
Total Hg Mass less Spike (ng)	1.8	1.6	2.2	1.9	1.9	1.5	1.6	1.5	1.6	1.6	2.4	2.2
Breakthrough (%)	29.9%	25.2%	0.4%	16.6%	12.8%	43.4%	0.7%	23.3%	0.1%	19.8%	1.3%	42.3%
Volume of Sample (dscm)	0.070	0.070	0.070	0.070	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069
Hg Concentration (µg/dscm)	0.03	0.02	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.04	0.03
Relative Deviation (%)	3.5%		7.6%		9.9%		4.9%		0.3%		3.5%	
Measured Spike Concentration (µg/dscm)	n/a		n/a		n/a		0.73		0.73		0.73	
Spike Recovery (%)	n/a	n/a	n/a	n/a	n/a	n/a	100.31%	n/a	100.02%	n/a	100.33%	n/a
Moisture Concentration (%/100)	0.135	0.135	0.124	0.124	0.124	0.124	0.124	0.124	0.124	0.124	0.124	0.124
Corrected Hg Concentration (µg/wscm)	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03

Average Spike Recovery (%) **100.2%** (85-115%)  
Average Hg Concentration >1 µg/dscm? N  
Average Hg Concentration >0.5 µg/dscm? N  
Average Hg Concentration ≤0.1 µg/dscm? Y

Breakthrough Limit = n/a  
Relative Deviation Limit = 20% or +/-0.2

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PacifiCorp  
Huntington Unit 1  
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		Run #		1		2		3	
		Start Time		9:05		10:13		11:18	
		Stop Time		10:05		11:13		12:18	
EPA Method 30B Meter Data		A	B	A	B	A	B	A	B
<b>Inputs</b>									
P <sub>bar</sub>	Barometric Pressure ("Hg)	23.77	23.77	23.77	23.77	23.77	23.77	23.77	23.77
V <sub>m</sub>	Volume of Stack Gas Collected (L)	90.017	90.036	90.005	90.026	90.003	90.018	90.003	90.018
Y	Meter Calibration Factor (unitless)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
T <sub>m</sub>	Temperature at Gas Meter (°F)	78	79	83	85	86	88	86	88
<b>Calculations</b>									
V <sub>m</sub>	Volume of Stack Gas Collected (dcm)	0.090017	0.090036	0.090005	0.090026	0.090003	0.090018	0.090003	0.090018
P <sub>bar</sub>	Absolute Pressure at Gas Meter (mmHg)	603.69	603.69	603.69	603.69	603.69	603.69	603.69	603.69
T <sub>m</sub>	Absolute Temperature at Gas Meter (K)	299	299	301	303	303	304	303	304
V <sub>m(std)</sub>	Sample Gas Volume (dscm)	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07



	Run # Start Time Stop Time	4		5		6		7		8		9	
		5:51 6:51		6:54 7:54		7:59 8:59		9:02 10:02		10:05 11:05		11:08 12:08	
		A	B	A	B	A	B	A	B	A	B	A	B
EPA Method 30B Meter Data													
Inputs													
P <sub>bar</sub>	Barometric Pressure (inHg)	23.68	23.68	23.68	23.68	23.68	23.68	23.68	23.68	23.68	23.68	23.68	23.68
V <sub>m</sub>	Volume of Stack Gas Collected (L)	90.011	90.025	90.033	90.038	90.024	90.013	90.058	90.022	90.026	90.203	90.031	90.044
Y	Meter Calibration Factor (unitless)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
T <sub>m</sub>	Temperature at Gas Meter (°F)	75	77	77	78	82	85	86	87	86	87	87	88
Calculations													
V <sub>m</sub>	Volume of Stack Gas Collected (dcm)	0.090011	0.090025	0.090033	0.090038	0.090024	0.090013	0.090058	0.090022	0.090026	0.090203	0.090031	0.090044
P <sub>bar</sub>	Absolute Pressure at Gas Meter (mmHg)	601.40	601.40	601.40	601.40	601.40	601.40	601.40	601.40	601.40	601.40	601.40	601.40
T <sub>m</sub>	Absolute Temperature at Gas Meter (K)	297	298	298	299	301	303	303	304	303	304	304	304
V <sub>m(std)</sub>	Sample Gas Volume (dscm)	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07

PC16-31  
PacifiCorp  
Huntington Unit 1  
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		Run #	1	2	3
		Start Time	9:05	10:13	11:18
		Stop Time	9:41	10:49	11:56
<b>EPA Method 4 Data</b>					
<b>Inputs</b>					
P <sub>bar</sub>	Barometric Pressure ("Hg)		23.77	23.77	23.77
	Stack Static Pressure ("H <sub>2</sub> O)		-2.4	-2.4	-2.4
	Stack Gas Temperature (F)		116	117	117
V <sub>lc</sub>	Volume of Water Condensed (mL)		62.1	68.2	69.8
V <sub>m</sub>	Volume of Stack Gas Collected (dcf)		28.419	28.558	31.612
Y	Meter Calibration Factor (unitless)		0.9966	0.9966	0.9966
ΔH	Pressure Differential Across Orifice ("H <sub>2</sub> O)		1.8	1.8	1.8
T <sub>m</sub>	Temperature at Gas Meter (°F)		82	87	90
<b>Calculations</b>					
P <sub>m</sub>	Absolute Pressure at Gas Meter ("Hg)		23.90	23.90	23.90
T <sub>m</sub>	Absolute Temperature at Gas Meter (°R)		542	547	550
V <sub>wc(std)</sub>	Volume of Water Condensed (scf)		2.92	3.21	3.28
V <sub>m(std)</sub>	Sample Gas Volume (dscf)		22.03	21.94	24.15
	Stack Gas Temperature (C)		47	47	47
B <sub>ws sat</sub>	Saturated Moisture Content (%/100)		0.131	0.134	0.134
B <sub>ws</sub>	Actual Stack Gas Moisture Content (%/100)		0.117	0.128	0.120
	Moisture Content Used (%/100)		0.117	0.128	0.120

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PacifiCorp  
Huntington Unit 1  
6/29/2016

	Run #	4	5	6	7	8	9
	Start Time	5:51	6:54	7:59	7:59	7:59	11:08
	Stop Time	6:24	7:30	8:35	8:35	8:35	11:44
<b>EPA Method 4 Data</b>							
<b>Inputs</b>							
P <sub>bar</sub>	Barometric Pressure ("Hg)	23.68	23.68	23.68	23.68	23.68	23.68
	Stack Static Pressure ("H <sub>2</sub> O)	-2.4	-2.4	-2.4	-2.4	-2.4	-2.4
	Stack Gas Temperature (F)	117	114	114	114	114	114
V <sub>lc</sub>	Volume of Water Condensed (mL)	75.6	70.1	73	73	73	72.4
V <sub>m</sub>	Volume of Stack Gas Collected (dcf)	29.479	28.515	31.297	31.297	31.297	29.845
Y	Meter Calibration Factor (unitless)	0.9966	0.9966	0.9966	0.9966	0.9966	0.9966
ΔH	Pressure Differential Across Orifice ("H <sub>2</sub> O)	1.8	1.8	1.8	1.8	1.8	1.8
T <sub>m</sub>	Temperature at Gas Meter (°F)	82	82	84	84	84	83
<b>Calculations</b>							
P <sub>m</sub>	Absolute Pressure at Gas Meter ("Hg)	23.81	23.81	23.81	23.81	23.81	23.81
T <sub>m</sub>	Absolute Temperature at Gas Meter (°R)	542	542	544	544	544	543
V <sub>wc(std)</sub>	Volume of Water Condensed (scf)	3.56	3.30	3.44	3.44	3.44	3.41
V <sub>m(std)</sub>	Sample Gas Volume (dscf)	22.77	22.02	24.08	24.08	24.08	23.01
	Stack Gas Temperature (C)	47	46	46	46	46	46
B <sub>ws sat</sub>	Saturated Moisture Content (%/100)	0.135	0.124	0.124	0.124	0.124	0.124
B <sub>ws</sub>	Actual Stack Gas Moisture Content (%/100)	0.135	0.130	0.125	0.125	0.125	0.129
	Moisture Content Used (%/100)	0.135	0.124	0.124	0.124	0.124	0.124
		Saturated	Saturated	Saturated	Saturated	Saturated	Saturated

# Sample Calculations

**EPA Method 30B: Determination of Total Vapor Phase Mercury Emissions  
from Coal-Fired Combustion Sources Using Carbon Sorbent Traps  
(40 CFR Part 60, Appendix A-8)**

Variable	Value	Definition	Unit of Measurement
P <sub>bar</sub>	23.77	Barometric Pressure	in. Hg
P <sub>m</sub>	604	Absolute Pressure at Gas Meter	mmHg
t <sub>m</sub>	78	Temperature at Gas Meter	°F
T <sub>m</sub>	299	Absolute Temperature at Gas Meter	K
Y	1.000	Meter Calibration Factor	Unitless
V <sub>m</sub>	90.017	Volume of Stack Gas Collected	L
V <sub>m</sub>	0.0900	Volume of Stack Gas Collected	dcm
T <sub>std</sub>	293	Standard Temperature	K
P <sub>std</sub>	760	Standard Pressure	mmHg
V <sub>m(std)</sub>	0.070	Sample Gas Volume	dscm
A <sub>2</sub>	7.12E-10	Coefficient from Calibration Curve	unitless
A <sub>1</sub>	0.0051	Coefficient from Calibration Curve	unitless
b	-1.6728	Y intercept of Calibration Curve	unitless
AC1	437	Area Counts from Tube Section 1	unitless
AC2	79	Area Counts from Tube Section 2	unitless
RF	189.6	Low-Level Response Factor	Unitless
m <sub>1</sub>	2.3	Hg mass from Tube Section 1	nanograms
m <sub>2</sub>	0.0	Hg mass from Tube Section 2	nanograms
B	0.0%	Breakthrough	percent
C <sub>a</sub>	0.03	Hg Concentration, Sorbent Trap A	µg/dscm
C <sub>b</sub>	0.04	Hg Concentration, Sorbent Trap B	µg/dscm
RD	7.0%	Relative Deviation between Traps A and B	percent
B <sub>ws</sub>	0.117	Stack Gas Moisture Content (From EPA Method 4)	%/100
C <sub>w(a)</sub>	0.03	Hg Concentration corrected for moisture	µg/wscm
C <sub>w(b)</sub>	0.03	Hg Concentration corrected for moisture	µg/wscm
C <sub>w(avg)</sub>	0.03	Hg Concentration corrected for moisture	µg/wscm

$$\begin{aligned}
 P_m &= P_{bar} (25.3971 \text{ mmHg/in.Hg}) \\
 &= 23.77 (25.3971) \\
 &= \mathbf{603.69 \text{ mmHg}}
 \end{aligned}$$

$$\begin{aligned}
 T_m &= 273.15 + ((t_m - 32)/1.8) \\
 &= 273.15 + ((78 - 32)/1.8) \\
 &= \mathbf{299 \text{ K}}
 \end{aligned}$$

$$\begin{aligned}
 V_m &= (0.001)L \\
 &= (0.001) 90.017 \\
 &= \mathbf{0.0900 \text{ dcm}}
 \end{aligned}$$

$$\begin{aligned}
 V_{m(std)} &= \frac{V_m \times Y \times T_{std} \times P_m}{T_m \times P_{std}} \\
 &= \frac{0.090017 \times 1 \times 293 \times 603.69}{299 \times 760} \\
 &= \mathbf{0.070 \text{ dscm}}
 \end{aligned}$$

PacifiCorp  
Huntington Unit 1  
6/28/2016  
Run #1 Sample Calculations

$$\begin{aligned} m_1 &= A_2(AC1)^2 + A_1(AC1) + b \\ &= 7.12E-10 (437)^2 + 0.0051 (437) + (-1.67) \\ &= \mathbf{0.6 \text{ ng}} \quad (\text{Mass less than lowest standard}) \end{aligned}$$

$$\begin{aligned} m_2 &= A_2(AC2)^2 + A_1(AC2) + b \\ &= 7.12E-10 (79)^2 + 0.0051 (79) + (-1.67) \\ &= \mathbf{0.0 \text{ ng}} \quad (\text{Section 2 for breakthrough determination only}) \end{aligned}$$

$$\begin{aligned} m_1 &= AC/RF \\ &= (437)/(189.6) \\ &= \mathbf{2.3 \text{ ng}} \quad (\text{Mass recalculated using Response Factor Method}) \end{aligned}$$

$$\begin{aligned} B &= 100 (m_2 / m_1) \\ &= 100 (0.0 / 0.6) \\ &= \mathbf{0.0\%} \end{aligned}$$

$$\begin{aligned} C_a &= \frac{(m_1)}{(1000 \text{ ng}/\mu\text{g}) (\text{dscm})} \\ &= \frac{(2.3)}{(1000) (0.070)} \\ &= \mathbf{0.03 \text{ ug/dscm}} \quad (\text{Eq. 30B-3}) \end{aligned}$$

$$\begin{aligned} RD &= \frac{100 |C_a - C_b|}{C_a + C_b} \\ &= \frac{100 |0.03 - 0.04|}{0.03 + 0.04} \\ &= \mathbf{7.0\%} \quad (\text{Eq. 30B-5}) \end{aligned}$$

$$\begin{aligned} C_{w(a)} &= C_a (1 - B_{ws}) \\ &= 0.03 (1 - 0.117) \\ &= \mathbf{0.03 \text{ ug/wscm}} \quad (\text{Eq. 30B-4}) \end{aligned}$$

$$\begin{aligned} C_{w(b)} &= C_b (1 - B_{ws}) \\ &= 0.04 (1 - 0.117) \\ &= \mathbf{0.03 \text{ ug/wscm}} \quad (\text{Eq. 30B-4}) \end{aligned}$$

$$\begin{aligned} C_{w(\text{avg})} &= \frac{C_{w(a)} + C_{w(b)}}{2} \\ &= \frac{0.029 + 0.033}{2} \\ &= \mathbf{0.03 \text{ ug/wscm}} \end{aligned}$$

# Field Datasheets

## EPA Method 30B Analysis Datasheet

Client Pacificorp

Facility / Unit Huntington Unit 1

### Initial Calibration

Date	6-28	6-29
Hg (ng)	Area Counts	Area Counts
5	1250	944
10	2370	2020
50	9980	9040
100	19800	14800
500	96500	94400
500 2nd	95800	96900
2.5	475	451

474

### CCVS

Following Run #	Hg (ng)	Area Counts
3	500	92600
6	500	92500
9	500	97800

### Run Analyses

Run ID	Start Time	Tube #	Area Counts		Results	
			Section A	Section B	µg/wscm	lb/Tbtu
R1A	905	353334	437	79	0.03	0.0347
R1B	905	357490	502	21	0.03	0.0306
R2A	1013	353417	439	367	0.03	0.0366
R2B	1013	353460	-8	148	0.02	0.0234
R3A	1118	353254	290	-70	0.02	0.0234
R3B	1118	353284	297	28	0.02	0.0234
500CCV	5		92600			
R4A	551	353290	245	86	0.02	0.0232
R4B	551	353406	236	72	0.02	
R6A	654	353372	392	12	0.03	0.0278
R6B	654	357474	289	60	0.02	
R6A	759	353388	298	50	0.02	0.0236
R6B	759	353429	191	96	0.02	
R7A	902	361394 spike 50	9560	82	0.02	0.0216
R7B	902	353315	218	63	0.02	
R8A	1005	3612765 spike 50	29610	20	0.02	0.0248
R8B	1005	353259	20237	59	0.02	
R9A	1109	361409 spike 50	9650	135	0.03	0.0327
R9B	1109	353456	285	135	0.03	



Emissions Measurement Company  
4 & 30B Data Sheet

EMCo Job #: PC16-31	Operator: SS
Client: Pacificorp	Barometric Pressure ("Hg): 23.77
Source: 112 Huntington	Notes:
Date: 6/28/16	

Initial Weight:		Post Weight:	
Trap ID: 3533314		Trap ID: 357490	
Run # 1		Run # 1	
Meter ID: 303-1 Hyd: 1.000		Meter ID: 303-1 Hyd: 1.000	
Start Time: 905		Start Time: 905	
Stop Time: 1005		Stop Time: 1005	
Sample Time	Sample Rate (Lpm)	Sample Volume (L)	Sample Rate (Lpm)
0	1.5	0	1.5
10	1.5	15.2	1.5
20	1.5	30.1	1.5
30	1.5	45.1	1.5
40	1.5	60.0	1.5
50	1.5	74.9	1.5
60	1.5	90.017	1.5
Total	Average	Total	Average
60	1.5	90.017	1.5

DGM Temp (F)	Imp. Outlet Temp (F)	Vacuum ("Hg)	Sample Time
73	37	9	0
76	40	9	10
77	43	9	20
78	44	9	30
79	49	9	40
80	50	9	50
81	51	9	60
78	51	9	Total
Average	Maximum	Maximum	Total
78	51	9	60

DGM Temp (F)	Imp. Outlet Temp (F)	Vacuum ("Hg)	Sample Volume (L)
74	37	10	0
75	40	10	15.1
78	45	10	30.0
80	48	10	45.0
81	49	10	60.1
81	50	10	75.1
82	51	10	90.036
79	51	10	90.036
Average	Maximum	Maximum	Total
79	51	10	90.036

O <sub>2</sub> (%)	CO <sub>2</sub> (%)	Pre-Test Leak Check ("H <sub>2</sub> O @ "Hg):	Post-Test Leak Check ("H <sub>2</sub> O @ "Hg):
		0.00 @ 13"	0.00 @ 13"

Run # 1		Meter Box ID: 115-1	
RATA Run #		Yd: 0.9966 ΔH@: 1.9624	
Start Time: 905		Pre-Test Leak Check ("H <sub>2</sub> O @ "Hg): 0.00 @ 5"	
Stop Time: 941		Post-Test Leak Check ("H <sub>2</sub> O @ "Hg): 0.00 @ 5"	
Sample Time	Drift Pressure ΔH ("H <sub>2</sub> O)	DGM Temp (F)	Imp. Outlet Temp (F)
0	1.8	78	37
10	1.8	85	40
20	1.8	85	45
30	1.8	86	48
40	1.8	86	49
Total	Average	Average	Maximum
40	1.8	86	49

Sample Volume (ft <sup>3</sup> )	Vacuum ("Hg)
105.025	2
111.3	2
119.5	2
126.8	2
133.44	2
Total	Maximum
288.419	2

Impinger Weights	Initial	Final
Impinger 1		
Impinger 2		
Impinger 3		
Impinger 4 (SG)		
Total	718.4	780.5
	Total	62.1

EMCo Job #: PC16-31	Operator: SS
Client: PAVER CORP	Barometric Pressure ("Hg): 23.77
Source: 111 Huntington	Notes:
Date: 6/28/16	

Initial Weight:		Post Weight:	
Trap ID: 353460		Run # 2	
Run # 2		Meter ID: 303-13Yd: 1.00G	
Start Time: 1013		Stop Time: 1113	
Sample Time		Sample Rate (Lpm)	Sample Volume (L)
0	1.5	0	0
40	1.5	15.0	15.0
4020	1.5	30.1	30.1
4530	1.5	45.1	45.1
2040	1.5	60.2	60.2
2550	1.5	75.1	75.1
3060	1.5	90.026	90.026
60	1.5	90.026	90.026
Total	Average	Total	Average
		51	51

Run # 2		Meter Box ID: 125-1	
RATA Run #		Yd: 0.9966 ΔH@: 1.9624	
Start Time: 1013		Pre-Test Leak Check ("H <sub>2</sub> O @ "Hg): 0.00 @ 6"	
Stop Time: 1047		Post-Test Leak Check ("H <sub>2</sub> O @ "Hg): 0.00 @ 6"	
Sample Time	Drift Pressure ΔH ("H <sub>2</sub> O)	DGM Temp (°F)	Vacuum ("Hg)
0	1.8	83	3
10	1.8	83	3
20	1.8	84	3
30	1.8	85	3
36	1.8	85	3
Total	Average	Total	Average
		28.558	87

Impinger Weights	Initial	Final
Impinger 1		
Impinger 2		
Impinger 3		
Impinger 4 (SG)		
Total	746.5	848.7
		108.2



Run #	Sample Time	Drift Pressure $\Delta H$ ("H <sub>2</sub> O)	Sample Volume (ft <sup>3</sup> )	Inlet	DGM Temp (°F)	Outlet	Imp. Outlet Temp (°F)	Vacuum ("Hg)
3	0	1.6	192.215	87	88	87	43	3
RATA Run #	10	1.6	170.3	87	87	87	57	3
Start Time: 11:3	20	1.6	177.6	85	85	85	52	3
Stop Time: 1:54	30	1.6	145.9	85	85	85	53	3
	36	1.6	193.927	84	84	84	54	3
Total	36	1.6	(31.612)				54	3
Average					90			Maximum

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EMCo Job #: PC16-31	Operator: 55
Client: Pacificorp	Barometric Pressure ("Hg): 23.64
Source: 1st Huntington	Notes:
Date: 6/29/16	

Initial Weight:		Post Weight:	
Trap ID: 353290		Trap ID: 353406	
Run # 4		Run # 4	
Meter ID: 508-1A Yd: 1000		Meter ID: 303-1B Yd: 1000	
Start Time: 5:51		Start Time: 5:51	
Stop Time: 6:24		Stop Time: 6:51	
Pre-Test Leak Check ("H <sub>2</sub> O @ "Hg): 0.00 @ 15"		Pre-Test Leak Check ("H <sub>2</sub> O @ "Hg): 0.00 @ 16"	
Post-Test Leak Check ("H <sub>2</sub> O @ "Hg): 0.00 @ 15"		Post-Test Leak Check ("H <sub>2</sub> O @ "Hg): 0.00 @ 16"	
Sample Time	Sample Rate (Lpm)	Sample Volume (L)	Sample Rate (Lpm)
0	1.5	0	1.5
3:10	1.5	15.0	1.5
20:20	1.5	30.0	1.5
45:30	1.5	45.1	1.5
20:10	1.5	60.1	1.5
23:50	1.5	75.0	1.5
30:60	1.5	90.011	1.5
6:00	1.5	90.011	1.5
Total	Average	Total	Average
DGM Temp (F)	Imp. Outlet Temp (°F)	Vacuum ("Hg)	Sample Time
73	57	10	0
74	45	10	3:10
75	42	10	20:20
76	40	10	45:30
77	40	10	20:10
77	41	10	23:50
77	41	10	30:60
77	57	10	6:00
Average	Maximum	Maximum	Total
75	57	10	90.025
DGM Temp (F)	Imp. Outlet Temp (°F)	Vacuum ("Hg)	Sample Time
73	57	10	0
75	45	10	3:10
77	42	10	20:20
77	40	10	45:30
78	40	10	20:10
78	41	10	23:50
78	41	10	30:60
77	57	10	6:00
Average	Maximum	Maximum	Total
77	57	10	90.025

Run # 4		Meter Box ID: 115-1	
RATA Run #		Yd: 0.9966 ΔH@: 1.8624	
Start Time: 5:51		Pre-Test Leak Check ("H <sub>2</sub> O @ "Hg): 0.00 @ 6"	
Stop Time: 6:24		Post-Test Leak Check ("H <sub>2</sub> O @ "Hg): 0.00 @ 6"	
Sample Time	Drift Pressure ΔH ("H <sub>2</sub> O)	Sample Volume (ft <sup>3</sup> )	Vacuum ("Hg)
0	1.8	250.925	3
10	1.8	255.3	3
20	1.8	265.4	3
30	1.8	272.9	3
36	1.8	286.464	3
Total	Average	Total	Maximum
36	1.8	29.479	57
DGM Temp (°F)	Imp. Outlet Temp (°F)	Vacuum ("Hg)	Sample Time
77	57	3	0
79	45	3	10
79	42	3	20
80	40	3	30
80	40	3	36
Average	Maximum	Maximum	Total
82	57	3	29.479

Impinger Weights	Initial	Final
Impinger 1		
Impinger 2		
Impinger 3		
Impinger 4 (SG)		
Total	75.9	82.5
	Total	75.6



Emissions Measurement Company  
4 & 30B Data Sheet

EMCo Job #: PC16-31	Operator: SS
Client: Peabody	Barometric Pressure (Hg): 23.08
Source: 44 Huntington	Notes:
Date: 6/29/16	

Initial Weight:		Post Weight:				
Trap ID: 3533429						
Run # 5						
Meter ID: 3B-13 Yd: 1.000		O <sub>2</sub> (%):				
Start Time: 6:54		CO <sub>2</sub> (%):				
Stop Time: 7:54		Pre-Test Leak Check ("H <sub>2</sub> O @ "Hg): 0.00 @ 15"				
		Post-Test Leak Check ("H <sub>2</sub> O @ "Hg): 0.00 @ 15"				
Sample Time	Sample Rate (Lpm)	Sample Volume (L)	DGM Temp (F)	Imp. Outlet Temp (F)	Vacuum ("Hg)	Stack Temp (F)
0	1.5	0	43	33	10	117
5:10	1.5	15.0	71	35	10	117
10:20	1.5	30.0	79	40	10	117
15:30	1.5	44.9	81	42	10	117
20:40	1.5	60.0	82	44	10	114
25:50	1.5	75.1	82	45	10	114
30:00	1.5	90.033	83	46	10	114
60	1.5	90.033	77	46	10	114
Total	Average	Total	Average	Maximum	Maximum	

Run # 5		Meter Box ID: M5-1					
RATA Run #		Yd: 0.9966 ΔH: 1.8624					
Start Time: 6:54		Pre-Test Leak Check ("H <sub>2</sub> O @ "Hg): 0.00 @ 6"					
Stop Time: 7:30		Post-Test Leak Check ("H <sub>2</sub> O @ "Hg): 0.00 @ 6"					
Sample Time	Drift Pressure ΔH ("H <sub>2</sub> O)	Sample Volume (ft <sup>3</sup> )	DGM Temp (F)	Inlet	Outlet	Imp. Outlet Temp (F)	Vacuum ("Hg)
0	1.8	280.965	61	80		33	3
10	1.8	288.2	82	40		35	3
20	1.8	295.5	83	41		40	3
30	1.8	303.8	83	41		42	3
36	1.8	309.470	84	41		44	3
Total	Average	Total	Average	Maximum	Maximum	Maximum	Maximum

Impinger Weights	Initial	Final
Impinger 1		
Impinger 2		
Impinger 3		
Impinger 4 (SG)		
Total	674.4	744.5
	Total	70.1

Emissions Measurement Company  
4 & 30B Data Sheet


EMCo Job #: PC16-031	Operator: 55
Client: Pacificorp	Barometric Pressure ("Hg): 33.68
Source: W. Huntington	Notes:
Date: 6/29/16	

Initial Weight:		Post Weight:	
Trap ID: 353372	Trap ID: 357474		
Run # 6	Run # 6		
Meter ID: 30B-1A Yd: 1.000	Meter ID: 30B-1B Yd: 1.000		
Start Time: 159	Start Time: 759		
Stop Time: 827	Stop Time: 859		
Pre-Test Leak Check ("H <sub>2</sub> O @ "Hg): 0.00 @ 15		Pre-Test Leak Check ("H <sub>2</sub> O @ "Hg): 0.00 @ 15	
Post-Test Leak Check ("H <sub>2</sub> O @ "Hg): 0.00 @ 15		Post-Test Leak Check ("H <sub>2</sub> O @ "Hg): 0.00 @ 15	
Sample Time	Sample Rate (Lpm)	Sample Volume (L)	Sample Rate (Lpm)
0	1.5	0	1.5
10	1.5	15.2	1.5
20	1.5	30.2	1.5
30	1.5	45.1	1.5
40	1.5	60.1	1.5
50	1.5	75.0	1.5
60	1.5	90.024	1.5
60	1.5	90.024	1.5
Total	Average	Total	Average
DGM Temp (F)	Imp. Outlet Temp (°F)	Vacuum ("Hg)	DGM Temp (F)
81	38	10	84
81	39	10	84
82	42	10	85
82	47	10	85
82	54	10	85
83	55	10	85
83	56	10	85
82	56	10	85
Average	Maximum	Maximum	Average
Imp. Outlet Temp (°F)	Vacuum ("Hg)	Imp. Outlet Temp (°F)	Vacuum ("Hg)
38	10	38	10
39	10	39	10
42	10	42	10
47	10	47	10
54	10	54	10
55	10	55	10
56	10	56	10
56	10	56	10
Average	Maximum	Maximum	Average
Stack Temp (F)	Stack Temp (F)		
114	114		
114	114		
114	114		
114	114		
114	114		
114	114		
114	114		
Average	Maximum		

Meter Box ID: 45-1	
Yd: 1.000	ΔH: 1.8624
Pre-Test Leak Check ("H <sub>2</sub> O @ "Hg): 0.00 @ 6	
Post-Test Leak Check ("H <sub>2</sub> O @ "Hg): 0.00 @ 6	
Sample Time	Drift Pressure ΔH ("H <sub>2</sub> O)
0	1.6
10	1.8
20	1.8
30	1.8
30	1.8
Total	Average
DGM Temp (°F)	Imp. Outlet Temp (°F)
86	38
86	39
86	42
86	47
86	54
Average	Maximum
Sample Volume (ft³)	Vacuum ("Hg)
309.41	2
315.2	2
323.8	2
332.5	2
340.768	2
Total	Maximum
Average	Average

Impinger Weights	Initial	Final
Impinger 1		
Impinger 2		
Impinger 3		
Impinger 4 (SG)		
Total	682.5	755.5
	Total	73.0



Run #	Meter Box ID:					
RATA Run #	Yd:	$\Delta H @$ :				
Start Time:	Pre-Test Leak Check ("H <sub>2</sub> O @ "Hg): 0.00 @					
Stop Time:	Post-Test Leak Check ("H <sub>2</sub> O @ "Hg): 0.00 @					
Sample Time	Drifce Pressure $\Delta H$ ("H <sub>2</sub> O)	Sample Volume (ft <sup>3</sup> )	DGM Temp (°F) Inlet	Outlet	Imp. Outlet Temp (°F)	Vacuum ("Hg)
0						
Total	Average	Total	Average		Maximum	Maximum

Impinger Weights	Initial	Final
Impinger 1		
Impinger 2		
Impinger 3		
Impinger 4 (SG)		
Total	<i>25</i>	
	Total	

[illegible]

Impinger Weights	Initial	Final
Impinger 1		
Impinger 2		
Impinger 3		
Impinger 4 (SG)		
Total		
		Total



Run #	Meter Box ID:	DGM Temp (°F)	Inlet	Outlet	Imp. Outlet Temp (°F)	Vacuum ("Hg)
RATA Run #	Yd09966	ΔH @ "H <sub>2</sub> O	Pre-Test Leak Check ("H <sub>2</sub> O @ "Hg):	Post-Test Leak Check ("H <sub>2</sub> O @ "Hg):	0.00 @ 0	0
Start Time: 1105						
Stop Time: 1206	1144					
Sample Time	Drift Pressure ΔH ("H <sub>2</sub> O)	Sample Volume (ft³)	Inlet	Outlet	Imp. Outlet Temp (°F)	Vacuum ("Hg)
0	1.8	346.945	82	81	50	2
10	1.8	346.4	83	81	49	2
20	1.8	352.2	85	83	49	2
30	1.8	355.9	86	83	48	2
36	1.8	370.990	86	83	47	2
Total	Average 1.8	Total 129.845		Average 83	Maximum 50	Maximum 2

Impinger Weights	Initial	Final
Impinger 1		
Impinger 2		
Impinger 3		
Impinger 4 (SG)		
Total	621.6	696.2
	Total	674.4

# CEMS Data

# RATA Test - Part 75

Plant: HGTM Source: UNIT1

Parameter: HGT

Effective Date/Time: 06/29/2016 13:08

Monitoring System ID: 115

Test Reason: QA-Periodic Quality Assurance

Overall RA: 841.39

CEMS Time Offset :

Test Comment:

Unit of Measure: UG/SCM

Test Number: XML (115-Q2-2016-001) / EDR (1)

Frequency: 4QTRS

Test Result: PassAPS

Overall BAF: 1

Operating Level: High	Level BAF: 1.000	APS Indicator: True	Report in EDR: Y
Mean CEMS: 0.182	Relative Accuracy: 841.39	tValue: 2.306	Use BAF: Y
Mean Reference: 0.024	Standard Deviation: 0.056	Avg Load: 480	Reference Method: 30B
Mean Difference: -0.158	Confidence Coefficient: 0.043		

Run	Started	Ended	Reference Value	CEMS Value	Difference	Load	Use
1	06/28/2016 09:05	06/28/2016 10:04	0.031	0.323	-0.292	477	Y
2	06/28/2016 10:13	06/28/2016 11:12	0.027	0.205	-0.178	478	Y
3	06/28/2016 11:18	06/28/2016 12:17	0.020	0.204	-0.184	476	Y
4	06/29/2016 05:51	06/29/2016 06:50	0.021	0.158	-0.137	481	Y
5	06/29/2016 06:54	06/29/2016 07:53	0.025	0.142	-0.117	482	Y
6	06/29/2016 07:59	06/29/2016 08:58	0.021	0.147	-0.126	482	Y
7	06/29/2016 09:02	06/29/2016 10:01	0.020	0.146	-0.126	483	Y
8	06/29/2016 10:05	06/29/2016 11:04	0.020	0.161	-0.141	480	Y
9	06/29/2016 11:09	06/29/2016 12:08	0.030	0.154	-0.124	481	Y

# Average Data

Plant: HUNTINGTON PLANT  
Interval: 1 Minute

Type: Block  
Report Period: 06/28/2016 09:05 Through 06/28/2016 10:04  
Time Online Criteria: 1 minute(s)

2-1

Source Parameter (Unit)	UNIT1					
	CO2 (PCT)	HG0 (UG/M3)	HGLB/MM (LB/MMBTU)	HGLB/T (LB/TBTU)	HGT (UG/SCM)	UNITLOAD (MW)
06/28/16 09:05	11.1	0.305	0.000000000 F	0.440334594	0.435	481
06/28/16 09:06	11.0	0.340	0.000000000 F	0.453582327	0.444	480
06/28/16 09:07	11.0	0.338	0.000000000 F	0.477076709	0.467	479
06/28/16 09:08	11.0	0.332	0.000000000 F	0.474013963	0.464	477
06/28/16 09:09	11.0	0.308	0.000000000 F	0.477076709	0.467	476
06/28/16 09:10	11.0	0.280	0.000000000 F	0.459711618	0.450	473
06/28/16 09:11	10.9	0.265	0.000000000 F	0.453619816	0.440	472
06/28/16 09:12	10.9	0.247	0.000000000 F	0.454850770	0.441	471
06/28/16 09:13	10.9	0.279	0.000000000 F	0.46984128	0.455	473
06/28/16 09:14	11.0	0.308	0.000000000 F	0.452560745	0.443	476
06/28/16 09:15	11.0	0.296	0.000000000 F	0.447452636	0.438	477
06/28/16 09:16	11.0	0.280	0.000000000 F	0.413740636	0.405	477
06/28/16 09:17	10.9	0.284	0.000000000 F	0.391762568	0.380	478
06/28/16 09:18	10.9	0.284	0.000000000 F	0.378380165	0.367	477
06/28/16 09:19	10.9	0.242	0.000000000 F	0.379391119	0.368	475
06/28/16 09:20	10.9	0.196	0.000000000 F	0.408257834	0.396	474
06/28/16 09:21	10.9	0.257	0.000000000 F	0.454850770	0.441	475
06/28/16 09:22	11.0	0.314	0.000000000 F	0.398416938	0.380	477
06/28/16 09:23	11.0	0.281	0.000000000 F	0.341208327	0.334	479
06/28/16 09:24	11.1	0.243	0.000000000 F	0.330035351	0.325	482
06/28/16 09:25	11.1	0.307	0.000000000 F	0.342163891	0.338	483
06/28/16 09:26	11.0	0.368	0.000000000 F	0.326906181	0.320	483
06/28/16 09:27	11.0	0.337	0.000000000 F	0.314847200	0.308	483
06/28/16 09:28	11.0	0.301	0.000000000 F	0.299323472	0.289	480
06/28/16 09:29	11.0	0.305	0.000000000 F	0.295237145	0.289	478
06/28/16 09:30	10.9	0.306	0.000000000 F	0.305162422	0.296	477
06/28/16 09:31	10.9	0.281	0.000000000 F	0.324750660	0.315	474
06/28/16 09:32	10.8	0.252	0.000000000 F	0.327757500	0.315	473
06/28/16 09:33	10.9	0.259	0.000000000 F	0.331967228	0.322	473
06/28/16 09:34	11.0	0.282	0.000000000 F	0.338165163	0.332	474
06/28/16 09:35	10.9	0.278	0.000000000 F	0.362856553	0.352	475
06/28/16 09:36	10.9	0.291	0.000000000 F	0.316564825	0.309	476
06/28/16 09:37	11.1	0.289	0.000000000 F	0.270350507	0.267	480
06/28/16 09:38	11.1	0.284	0.000000000 F	0.287515459	0.284	480
06/28/16 09:39	11.0	0.283	0.000000000 F	0.329970927	0.323	480
06/28/16 09:40	10.9	0.278	0.000000000 F	0.318502917	0.307	478
06/28/16 09:41	10.9	0.281	0.000000000 F	0.302069559	0.293	476
06/28/16 09:42	10.9	0.241	0.000000000 F	0.278388668	0.271	474
06/28/16 09:43	10.9	0.289	0.000000000 F	0.287017119	0.259	473
06/28/16 09:44	10.9	0.334	0.000000000 F	0.241243266	0.234	473
06/28/16 09:45	10.9	0.277	0.000000000 F	0.223717045	0.217	475
06/28/16 09:46	10.9	0.216	0.000000000 F	0.230533724	0.224	478
06/28/16 09:47	11.0	0.253	0.000000000 F	0.251309127	0.248	478
06/28/16 09:48	11.0	0.287	0.000000000 F	0.260503363	0.255	479
06/28/16 09:49	11.0	0.281	0.000000000 F	0.277810254	0.272	479
06/28/16 09:50	10.9	0.271	0.000000000 F	0.288605247	0.278	476
06/28/16 09:51	10.9	0.241	0.000000000 F	0.303100513	0.294	476
06/28/16 09:52	10.9	0.206	0.000000000 F	0.291780018	0.283	474
06/28/16 09:53	11.0	0.196	0.000000000 F	0.28399745	0.278	472
06/28/16 09:54	10.9	0.185	0.000000000 F	0.269048073	0.260	474
06/28/16 09:55	10.9	0.236	0.000000000 F	0.256800440	0.252	478
06/28/16 09:56	11.1	0.204	0.000000000 F	0.231834648	0.229	481
06/28/16 09:57	11.0	0.273	0.000000000 F	0.219640090	0.215	481
06/28/16 09:58	11.0	0.257	0.000000000 F	0.237006981	0.232	483
06/28/16 09:59	11.1	0.253	0.000000000 F	0.287267891	0.284	483
06/28/16 10:00	10.9	0.246	0.000000000 F	0.287017119	0.259	480
06/28/16 10:01	10.9	0.290	0.000000000 F	0.285888165	0.258	479
06/28/16 10:02	10.8	0.331	0.000000000 F	0.247636000	0.238	477
06/28/16 10:03	10.9	0.270	0.000000000 F	0.231964678	0.225	473
06/28/16 10:04	10.8	0.207	0.000000000 F	0.215363500	0.207	469

Average	11.0	0.276	0.000000000	0.330983400	0.323	477
Minimum	10.8	0.185	0.000000000	0.215383500	0.207	469
Maximum	11.1	0.368	0.000000000	0.477076709	0.467	483
Summation	657.3	18.549	0.000000000	19.859003988	19.364	28.618

Included Data Points	60	60	0	60	60	60
Total number of Data Points	60	60	60	60	60	60

F = Unit Offline  
E = Exceedance  
I = Invalid  
M = Maintenance

C = Calibration  
S = Substituted  
T = Out Of Control



Average Data  
Plant: HUNTINGTON PLANT

R-2

Interval: 1 Minute  
Type: Block  
Report Period: 06/28/2016 10:13 Through 06/28/2016 11:12  
Time Online Criteria: 1 minute(s)

Source Parameter (Unit)	UNIT1					
	CO2 (PCT)	HG0 (UG/M3)	HGLB/MM (LB/MMBTU)	HGLB/T (LB/TBTU)	HGT (UG/SCM)	UNITLOAD (MW)
06/28/16 10:13	11.1	0.306	0.000000000 F	0.257144108	0.254	478
06/28/16 10:14	11.1	0.280	0.000000000 F	0.206549445	0.206	484
06/28/16 10:15	11.0	0.258	0.000000000 F	0.162388345	0.157	485
06/28/16 10:16	11.0	0.233	0.000000000 F	0.196143708	0.192	484
06/28/16 10:17	10.9	0.232	0.000000000 F	0.260831394	0.253	482
06/28/16 10:18	10.9	0.228	0.000000000 F	0.258004440	0.252	481
06/28/16 10:19	11.0	0.264	0.000000000 F	0.255395454	0.250	480
06/28/16 10:20	10.9	0.297	0.000000000 F	0.271140935	0.263	476
06/28/16 10:21	10.8	0.262	0.000000000 F	0.300704500	0.288	477
06/28/16 10:22	10.7	0.265	0.000000000 F	0.261505850	0.246	479
06/28/16 10:23	10.9	0.251	0.000000000 F	0.214435458	0.208	481
06/28/16 10:24	10.9	0.235	0.000000000 F	0.213407504	0.207	479
06/28/16 10:25	10.8	0.248	0.000000000 F	0.232031500	0.223	474
06/28/16 10:26	10.9	0.257	0.000000000 F	0.211345596	0.205	470
06/28/16 10:27	10.9	0.231	0.000000000 F	0.198974146	0.193	467
06/28/16 10:28	11.0	0.203	0.000000000 F	0.230200654	0.228	468
06/28/16 10:29	11.0	0.225	0.000000000 F	0.280042909	0.280	472
06/28/16 10:30	11.0	0.245	0.000000000 F	0.248244381	0.243	475
06/28/16 10:31	11.1	0.237	0.000000000 F	0.203488054	0.201	476
06/28/16 10:32	11.1	0.227	0.000000000 F	0.20562324	0.207	479
06/28/16 10:33	11.2	0.180	0.000000000 F	0.232774714	0.232	480
06/28/16 10:34	11.1	0.129	0.000000000 F	0.233735621	0.221	480
06/28/16 10:35	11.0	0.177	0.000000000 F	0.218618509	0.214	478
06/28/16 10:36	11.0	0.222	0.000000000 F	0.191035800	0.187	476
06/28/16 10:37	11.0	0.257	0.000000000 F	0.172647327	0.169	474
06/28/16 10:38	11.0	0.288	0.000000000 F	0.165486254	0.162	473
06/28/16 10:39	11.0	0.271	0.000000000 F	0.169582581	0.166	474
06/28/16 10:40	11.1	0.251	0.000000000 F	0.196401405	0.184	475
06/28/16 10:41	11.1	0.263	0.000000000 F	0.238921287	0.236	477
06/28/16 10:42	11.1	0.270	0.000000000 F	0.239933675	0.237	480
06/28/16 10:43	11.1	0.260	0.000000000 F	0.244895567	0.242	480
06/28/16 10:44	11.1	0.247	0.000000000 F	0.167290000	0.165	481
06/28/16 10:45	11.1	0.292	0.000000000 F	0.129584432	0.128	483
06/28/16 10:46	11.1	0.334	0.000000000 F	0.139708216	0.138	480
06/28/16 10:47	11.0	0.325	0.000000000 F	0.174880490	0.171	476
06/28/16 10:48	11.0	0.313	0.000000000 F	0.187971054	0.184	474
06/28/16 10:49	11.0	0.289	0.000000000 F	0.208402890	0.204	474
06/28/16 10:50	11.1	0.262	0.000000000 F	0.203488054	0.201	476
06/28/16 10:51	11.2	0.286	0.000000000 F	0.203677875	0.203	479
06/28/16 10:52	11.1	0.308	0.000000000 F	0.188302376	0.186	479
06/28/16 10:53	11.0	0.274	0.000000000 F	0.178776818	0.175	479
06/28/16 10:54	11.1	0.236	0.000000000 F	0.158943405	0.157	477
06/28/16 10:55	11.0	0.270	0.000000000 F	0.151184109	0.148	474
06/28/16 10:56	11.0	0.269	0.000000000 F	0.187971054	0.184	475
06/28/16 10:57	11.1	0.275	0.000000000 F	0.242970810	0.240	475
06/28/16 10:58	11.1	0.247	0.000000000 F	0.237908918	0.235	477
06/28/16 10:59	11.2	0.240	0.000000000 F	0.231771375	0.231	479
06/28/16 11:00	11.1	0.228	0.000000000 F	0.230822270	0.226	480
06/28/16 11:01	11.1	0.268	0.000000000 F	0.239933675	0.237	477
06/28/16 11:02	11.2	0.305	0.000000000 F	0.180801071	0.180	475
06/28/16 11:03	11.1	0.260	0.000000000 F	0.124522540	0.123	480
06/28/16 11:04	11.0	0.212	0.000000000 F	0.136891903	0.134	485
06/28/16 11:05	11.0	0.216	0.000000000 F	0.170604183	0.167	487
06/28/16 11:06	10.9	0.216	0.000000000 F	0.181447926	0.176	485
06/28/16 11:07	10.8	0.253	0.000000000 F	0.200816500	0.193	483
06/28/16 11:08	10.9	0.288	0.000000000 F	0.167633651	0.162	476
06/28/16 11:09	10.8	0.260	0.000000000 F	0.163126000	0.176	473
06/28/16 11:10	10.8	0.229	0.000000000 F	0.220566000	0.212	470
06/28/16 11:11	10.8	0.240	0.000000000 F	0.217570200	0.205	469
06/28/16 11:12	10.8	0.249	0.000000000 F	0.247636000	0.238	471
Average						
Average	11.0	0.255	0.000000000	0.209486898	0.205	478
Minimum	10.7	0.129	0.000000000	0.124522540	0.123	467
Maximum	11.2	0.334	0.000000000	0.300704500	0.289	487
Summation	660.2	15.293	0.000000000	12.589213893	12.301	28,650
Included Data	60	60	0	60	60	60
Excluded Data	60	60	60	60	60	60
Total number of Data Points	60	60	60	60	60	60

F = Unit Offline

E = Exceedance

I = Invalid

M = Maintenance

Report Generated: 06/28/16 11:14

C = Calibration

S = Substituted

T = Out Of Control

## Average Data

Plant: HUNTINGTON PLANT

Interval: 1 Minute

Type: Block

Report Period: 06/28/2016 11:18 Through 06/28/2016 12:17

Time Online Criteria: 1 minute(s)

B-3

Source Parameter (Unit)	UNIT1					UNIT/LOAD (MW)
	CO2 (PCT)	HG0 (UG/M3)	HGLB/MM (LB/MMBTU)	HGLB/T (LB/BBTU)	HGT (UG/SCM)	
06/28/16 11:18	11.0	0.230	0.000000000 F	0.280935000	0.275	470
06/28/16 11:19	10.9	0.231	0.000000000 F	0.317533871	0.308	471
06/28/16 11:20	10.8	0.227	0.000000000 F	0.283016000	0.272	476
06/28/16 11:21	10.8	0.262	0.000000000 F	0.244517500	0.235	479
06/28/16 11:22	10.9	0.293	0.000000000 F	0.173200283	0.168	480
06/28/16 11:23	10.8	0.258	0.000000000 F	0.111333500	0.107	480
06/28/16 11:24	10.8	0.214	0.000000000 F	0.159186500	0.153	479
06/28/16 11:25	10.8	0.242	0.000000000 F	0.238274500	0.229	476
06/28/16 11:26	10.7	0.266	0.000000000 F	0.215286881	0.205	475
06/28/16 11:27	10.7	0.237	0.000000000 F	0.181886800	0.173	469
06/28/16 11:28	10.7	0.205	0.000000000 F	0.185889700	0.177	469
06/28/16 11:29	10.6	0.251	0.000000000 F	0.208846018	0.197	470
06/28/16 11:30	10.7	0.282	0.000000000 F	0.233148794	0.222	472
06/28/16 11:31	10.7	0.271	0.000000000 F	0.273058317	0.260	473
06/28/16 11:32	10.8	0.246	0.000000000 F	0.255863000	0.248	475
06/28/16 11:33	10.8	0.242	0.000000000 F	0.244517500	0.235	475
06/28/16 11:34	10.8	0.233	0.000000000 F	0.263246500	0.253	477
06/28/16 11:35	10.9	0.215	0.000000000 F	0.295683834	0.287	477
06/28/16 11:36	10.9	0.193	0.000000000 F	0.261862348	0.254	477
06/28/16 11:37	10.9	0.255	0.000000000 F	0.226809908	0.220	479
06/28/16 11:38	10.9	0.313	0.000000000 F	0.191757467	0.186	479
06/28/16 11:39	10.9	0.280	0.000000000 F	0.167520500	0.161	479
06/28/16 11:40	10.8	0.245	0.000000000 F	0.163358500	0.157	479
06/28/16 11:41	10.8	0.277	0.000000000 F	0.174804000	0.168	479
06/28/16 11:42	10.8	0.307	0.000000000 F	0.210181000	0.202	476
06/28/16 11:43	10.8	0.284	0.000000000 F	0.259084500	0.249	475
06/28/16 11:44	10.6	0.259	0.000000000 F	0.219545500	0.211	474
06/28/16 11:45	10.8	0.264	0.000000000 F	0.173763500	0.167	473
06/28/16 11:46	10.8	0.268	0.000000000 F	0.207069500	0.199	474
06/28/16 11:47	10.7	0.259	0.000000000 F	0.267807196	0.255	475
06/28/16 11:48	10.7	0.246	0.000000000 F	0.274108542	0.268	477
06/28/16 11:49	10.8	0.230	0.000000000 F	0.280935000	0.270	476
06/28/16 11:50	10.8	0.206	0.000000000 F	0.283246500	0.253	475
06/28/16 11:51	10.8	0.205	0.000000000 F	0.251801000	0.242	475
06/28/16 11:52	10.8	0.201	0.000000000 F	0.213302500	0.205	476
06/28/16 11:53	10.9	0.207	0.000000000 F	0.178350064	0.173	478
06/28/16 11:54	10.9	0.210	0.000000000 F	0.205835388	0.203	480
06/28/16 11:55	10.8	0.200	0.000000000 F	0.262883302	0.255	461
06/28/16 11:56	10.8	0.188	0.000000000 F	0.235153000	0.225	482
06/28/16 11:57	10.8	0.224	0.000000000 F	0.199778000	0.192	481
06/28/16 11:58	10.8	0.256	0.000000000 F	0.151913000	0.145	479
06/28/16 11:59	10.8	0.236	0.000000000 F	0.111333500	0.107	476
06/28/16 12:00	10.8	0.213	0.000000000 F	0.144829500	0.138	477
06/28/16 12:01	10.8	0.222	0.000000000 F	0.201857000	0.194	475
06/28/16 12:02	10.7	0.227	0.000000000 F	0.218446654	0.208	475
06/28/16 12:03	10.8	0.224	0.000000000 F	0.234112500	0.225	474
06/28/16 12:04	10.8	0.219	0.000000000 F	0.200816800	0.193	475
06/28/16 12:05	10.8	0.274	0.000000000 F	0.167520500	0.161	476
06/28/16 12:06	10.8	0.327	0.000000000 F	0.183128000	0.175	470
06/28/16 12:07	10.7	0.290	0.000000000 F	0.220547100	0.210	476
06/28/16 12:08	10.7	0.250	0.000000000 F	0.204793738	0.195	476
06/28/16 12:09	10.8	0.222	0.000000000 F	0.188330500	0.181	477
06/28/16 12:10	10.9	0.192	0.000000000 F	0.201036055	0.195	477
06/28/16 12:11	10.7	0.217	0.000000000 F	0.235250243	0.224	476
06/28/16 12:12	10.7	0.238	0.000000000 F	0.194291495	0.185	475
06/28/16 12:13	10.8	0.241	0.000000000 F	0.150872500	0.145	477
06/28/16 12:14	10.9	0.241	0.000000000 F	0.147426440	0.143	478
06/28/16 12:15	10.9	0.237	0.000000000 F	0.163921706	0.159	479
06/28/16 12:16	10.9	0.229	0.000000000 F	0.170107431	0.165	480
06/28/16 12:17	10.8	0.258	0.000000000 F	0.187290000	0.180	479

Average	10.8	0.242	0.000000000	0.212259658	0.204	478
Minimum	10.6	0.188	0.000000000	0.111333500	0.107	469
Maximum	11.0	0.327	0.000000000	0.317533871	0.308	482
Summation	648.1	14.547	0.000000000	12.735579490	12.242	28.578

Included Data	60	60	0	60	60	60
Total number of These Studies	60	60	60	60	60	60

F = Unit Offline

E = Exceedance

I = Invalid

M = Maintenance

C = Calibration

S = Substituted

T = Out Of Control

Project PC16-0031: Huntington Unit 1 Hg RATA

Report Generated: 06/28/16 12:20

# Average Data

Plant: HUNTINGTON PLANT

Interval: 1 Minute

Type: Block

Report Period: 06/29/2016 05:51 Through 06/29/2016 06:50

Time Online Criteria: 1 minute(s)

12-41

Source Parameter (Unit)	UNIT1					UNITLOAD (MW)
	CO2 (PCT)	HG0 (UG/M3)	HGLB/MM (LB/MMBTU)	HGLB/T (LB/TBTU)	HGT (UG/SCM)	
06/29/16 05:51	10.8	0.262	0.000000000 F	0.169601500	0.163	481
06/29/16 05:52	10.8	0.244	0.000000000 F	0.171682500	0.185	482
06/29/16 05:53	10.8	0.220	0.000000000 F	0.181047000	0.174	483
06/29/16 05:54	10.8	0.234	0.000000000 F	0.204878500	0.197	483
06/29/16 05:55	10.8	0.243	0.000000000 F	0.172723000	0.166	482
06/29/16 05:56	10.8	0.230	0.000000000 F	0.142548500	0.137	483
06/29/16 05:57	10.8	0.210	0.000000000 F	0.104050000	0.100	480
06/29/16 05:58	10.7	0.236	0.000000000 F	0.079922069	0.076	480
06/29/16 05:59	10.8	0.256	0.000000000 F	0.105060600	0.101	480
06/29/16 06:00	10.8	0.288	0.000000000 F	0.153864000	0.148	479
06/29/16 06:01	10.8	0.314	0.000000000 F	0.104050000	0.100	478
06/29/16 06:02	10.7	0.300	0.000000000 F	0.050200721	0.048	479
06/29/16 06:03	10.7	0.282	0.000000000 F	0.080762248	0.077	480
06/29/16 06:04	10.7	0.260	0.000000000 F	0.139679631	0.133	490
06/29/16 06:05	10.7	0.232	0.000000000 F	0.175387457	0.167	479
06/29/16 06:06	10.7	0.200	0.000000000 F	0.235547102	0.210	478
06/29/16 06:07	10.6	0.162	0.000000000 F	0.208846018	0.197	477
06/29/16 06:08	10.7	0.186	0.000000000 F	0.196391943	0.167	479
06/29/16 06:09	10.7	0.205	0.000000000 F	0.165084317	0.153	479
06/29/16 06:10	10.8	0.233	0.000000000 F	0.132143500	0.127	478
06/29/16 06:11	10.7	0.255	0.000000000 F	0.166885663	0.159	476
06/29/16 06:12	10.8	0.205	0.000000000 F	0.223707500	0.215	476
06/29/16 06:13	10.7	0.150	0.000000000 F	0.163769252	0.175	474
06/29/16 06:14	10.7	0.187	0.000000000 F	0.137579083	0.131	473
06/29/16 06:15	10.7	0.218	0.000000000 F	0.148001626	0.141	476
06/29/16 06:16	10.6	0.259	0.000000000 F	0.162342717	0.172	479
06/29/16 06:17	10.7	0.295	0.000000000 F	0.150182074	0.143	483
06/29/16 06:18	10.7	0.283	0.000000000 F	0.121626018	0.116	484
06/29/16 06:19	10.7	0.225	0.000000000 F	0.131278037	0.125	485
06/29/16 06:20	10.6	0.216	0.000000000 F	0.163260339	0.154	485
06/29/16 06:21	10.6	0.202	0.000000000 F	0.178102188	0.168	484
06/29/16 06:22	10.7	0.227	0.000000000 F	0.201643065	0.182	486
06/29/16 06:23	10.7	0.245	0.000000000 F	0.178538130	0.170	486
06/29/16 06:24	10.8	0.222	0.000000000 F	0.159186500	0.153	489
06/29/16 06:25	10.7	0.192	0.000000000 F	0.120028815	0.120	482
06/29/16 06:26	10.7	0.218	0.000000000 F	0.100506465	0.096	483
06/29/16 06:27	10.6	0.238	0.000000000 F	0.125085584	0.118	481
06/29/16 06:28	10.7	0.242	0.000000000 F	0.169886112	0.161	489
06/29/16 06:29	10.7	0.240	0.000000000 F	0.205843962	0.196	484
06/29/16 06:30	10.7	0.234	0.000000000 F	0.255204504	0.243	479
06/29/16 06:31	10.8	0.222	0.000000000 F	0.210565500	0.199	475
06/29/16 06:32	10.5	0.256	0.000000000 F	0.162674742	0.152	474
06/29/16 06:33	10.6	0.285	0.000000000 F	0.170681264	0.161	474
06/29/16 06:34	10.6	0.232	0.000000000 F	0.202485226	0.191	476
06/29/16 06:35	10.8	0.174	0.000000000 F	0.219447339	0.207	476
06/29/16 06:36	10.5	0.189	0.000000000 F	0.249363257	0.233	477
06/29/16 06:37	10.8	0.189	0.000000000 F	0.225808132	0.213	478
06/29/16 06:38	10.7	0.213	0.000000000 F	0.200894166	0.197	481
06/29/16 06:39	10.7	0.223	0.000000000 F	0.188482392	0.188	481
06/29/16 06:40	10.8	0.232	0.000000000 F	0.203038000	0.196	482
06/29/16 06:41	10.7	0.236	0.000000000 F	0.196391943	0.187	484
06/29/16 06:42	10.8	0.216	0.000000000 F	0.196854500	0.189	484
06/29/16 06:43	10.8	0.191	0.000000000 F	0.161047000	0.174	483
06/29/16 06:44	10.9	0.225	0.000000000 F	0.174231247	0.169	483
06/29/16 06:45	10.8	0.252	0.000000000 F	0.159196500	0.153	483
06/29/16 06:46	10.8	0.247	0.000000000 F	0.152963500	0.147	483
06/29/16 06:47	10.7	0.237	0.000000000 F	0.135478934	0.129	483
06/29/16 06:48	10.7	0.240	0.000000000 F	0.127077140	0.121	482
06/29/16 06:49	10.8	0.230	0.000000000 F	0.133184000	0.128	482
06/29/16 06:50	10.8	0.228	0.000000000 F	0.153994000	0.148	483

Average	10.7	0.231	0.000000000	0.165392772	0.158	481
Minimum	10.5	0.150	0.000000000	0.050200721	0.048	473
Maximum	10.9	0.314	0.000000000	0.256204504	0.243	493
Summation	642.8	13.805	0.000000000	9.923568325	9.457	28.868
Included Data	60	60	0	60	60	60
Total number of Data Points	60	60	60	60	60	60

F = Unit Offline

E = Exceedance

I = Invalid

M = Maintenance

C = Calibration

S = Substituted

T = Out Of Control

Project PC16-0031: Huntington Unit 1 Hg RATA

Report Generated: 06/29/16 06:39



# Average Data

Plant: HUNTINGTON PLANT

Interval: 1 Minute

Type: Block

Report Period: 06/29/2016 06:54 Through 06/29/2016 07:53

Time Online Criteria: 1 minute(s)

R-5

Source Parameter (Unit)	UNIT1					
	CO2 (PCT)	HG0 (UG/M3)	HGLB/MM (LB/MMBTU)	HGLB/T (LB/TBTU)	HGT (UG/SCM)	UNTL0AD (MW)
06/29/16 06:54	10.8	0.214	0.000000000 F	0.185209000	0.178	483
06/29/16 06:55	10.9	0.164	0.000000000 F	0.142202751	0.136	483
06/29/16 06:56	10.9	0.196	0.000000000 F	0.102833031	0.100	482
06/29/16 06:57	10.9	0.222	0.000000000 F	0.136085945	0.132	483
06/29/16 06:58	10.8	0.238	0.000000000 F	0.196654500	0.189	482
06/29/16 06:59	10.7	0.249	0.000000000 F	0.174337233	0.166	482
06/29/16 07:00	10.7	0.226	0.000000000 F	0.147031401	0.140	481
06/29/16 07:01	10.7	0.189	0.000000000 F	0.109223327	0.104	481
06/29/16 07:02	10.7	0.258	0.000000000 F	0.082375585	0.076	480
06/29/16 07:03	10.7	0.312	0.000000000 F	0.096515613	0.092	482
06/29/16 07:04	10.8	0.263	0.000000000 F	0.129022000	0.124	479
06/29/16 07:05	10.8	0.209	0.000000000 F	0.095934100	0.092	479
06/29/16 07:06	10.7	0.197	0.000000000 F	0.063538570	0.061	480
06/29/16 07:07	10.7	0.180	0.000000000 F	0.087588706	0.083	480
06/29/16 07:08	10.7	0.224	0.000000000 F	0.134428710	0.128	480
06/29/16 07:09	10.7	0.263	0.000000000 F	0.158833869	0.151	482
06/29/16 07:10	10.8	0.239	0.000000000 F	0.185371000	0.182	484
06/29/16 07:11	10.9	0.211	0.000000000 F	0.161447928	0.176	485
06/29/16 07:12	10.9	0.199	0.000000000 F	0.180416972	0.175	485
06/29/16 07:13	10.8	0.182	0.000000000 F	0.168561000	0.162	484
06/29/16 07:14	10.8	0.166	0.000000000 F	0.166480000	0.160	484
06/29/16 07:15	10.8	0.146	0.000000000 F	0.175844500	0.169	483
06/29/16 07:16	10.8	0.199	0.000000000 F	0.199776000	0.192	481
06/29/16 07:17	10.7	0.248	0.000000000 F	0.171186560	0.163	482
06/29/16 07:18	10.8	0.196	0.000000000 F	0.141503000	0.130	483
06/29/16 07:19	10.9	0.138	0.000000000 F	0.137118889	0.133	484
06/29/16 07:20	10.9	0.155	0.000000000 F	0.150519302	0.146	486
06/29/16 07:21	10.9	0.167	0.000000000 F	0.146395486	0.142	483
06/29/16 07:22	10.8	0.187	0.000000000 F	0.152933500	0.147	482
06/29/16 07:23	10.8	0.202	0.000000000 F	0.148791500	0.143	488
06/29/16 07:24	10.7	0.206	0.000000000 F	0.157533644	0.150	486
06/29/16 07:25	10.8	0.206	0.000000000 F	0.112314000	0.108	480
06/29/16 07:26	10.8	0.180	0.000000000 F	0.070723453	0.069	477
06/29/16 07:27	10.8	0.149	0.000000000 F	0.080939700	0.087	477
06/29/16 07:28	10.7	0.208	0.000000000 F	0.134428710	0.128	478
06/29/16 07:29	10.7	0.262	0.000000000 F	0.147031401	0.140	478
06/29/16 07:30	10.8	0.210	0.000000000 F	0.164399000	0.158	477
06/29/16 07:31	10.8	0.153	0.000000000 F	0.177925500	0.171	478
06/29/16 07:32	10.9	0.204	0.000000000 F	0.195881284	0.190	482
06/29/16 07:33	11.0	0.270	0.000000000 F	0.159308703	0.156	482
06/29/16 07:34	10.8	0.239	0.000000000 F	0.125900500	0.121	483
06/29/16 07:35	10.8	0.203	0.000000000 F	0.127881500	0.123	483
06/29/16 07:36	10.9	0.192	0.000000000 F	0.148457394	0.144	482
06/29/16 07:37	10.9	0.178	0.000000000 F	0.134024036	0.130	481
06/29/16 07:38	10.8	0.206	0.000000000 F	0.130062800	0.125	480
06/29/16 07:39	10.8	0.243	0.000000000 F	0.149832000	0.144	480
06/29/16 07:40	10.8	0.218	0.000000000 F	0.188371000	0.182	479
06/29/16 07:41	10.9	0.184	0.000000000 F	0.178355004	0.173	481
06/29/16 07:42	10.9	0.170	0.000000000 F	0.167014568	0.162	481
06/29/16 07:43	10.8	0.145	0.000000000 F	0.183128000	0.176	481
06/29/16 07:44	10.8	0.184	0.000000000 F	0.211221500	0.203	479
06/29/16 07:45	10.7	0.256	0.000000000 F	0.187960149	0.179	478
06/29/16 07:46	10.8	0.224	0.000000000 F	0.156156000	0.152	477
06/29/16 07:47	10.8	0.188	0.000000000 F	0.148791500	0.143	478
06/29/16 07:48	10.8	0.192	0.000000000 F	0.155034500	0.149	479
06/29/16 07:49	10.9	0.194	0.000000000 F	0.162890752	0.158	482
06/29/16 07:50	10.9	0.215	0.000000000 F	0.181447928	0.178	486
06/29/16 07:51	10.9	0.233	0.000000000 F	0.142271669	0.138	487
06/29/16 07:52	10.9	0.174	0.000000000 F	0.080414422	0.078	487
06/29/16 07:53	10.8	0.106	0.000000000 F	0.103006500	0.098	486

Average	10.8	0.204	0.000000000	0.147095166	0.142	482
Minimum	10.7	0.106	0.000000000	0.063538570	0.061	476
Maximum	11.0	0.312	0.000000000	0.211221500	0.203	493
Summation	648.6	12.257	0.000000000	8.825709931	8.492	28,917

Included Data	60	60	0	60	60	60
Excluded Data	0	0	0	0	0	0
Total number of Data Points	60	60	0	60	60	60

F = Unit Offline

E = Exceedance

I = Invalid

M = Maintenance

C = Calibration

S = Substituted

T = Out Of Control

Project PC16-0031: Huntington Unit 1 Hg RATA

Report Generated: 06/29/16 07:59



**Average Data**  
Plant: HUNTINGTON PLANT

R-6

Type: Block  
Report Period: 06/29/2016 07:59 Through 06/29/2016 08:58  
Time Online Criteria: 1 minute(s)

Source Parameter (Unit)	UNIT1					
	CO2 (PCT)	HGO (UGA3)	HGLB/MM (LB/MMBTU)	HGLB/T (LB/TBTU)	HGT (UG/SCM)	UNTLLOAD (MW)
06/29/16 07:59	10.7	0.207	0.000000000 F	0.157533644	0.190	482
06/29/16 08:00	10.7	0.223	0.000000000 F	0.198542616	0.190	483
06/29/16 08:01	10.7	0.239	0.000000000 F	0.212145308	0.202	482
06/29/16 08:02	10.7	0.210	0.000000000 F	0.222647551	0.212	482
06/29/16 08:03	10.7	0.182	0.000000000 F	0.197442168	0.188	483
06/29/16 08:04	10.7	0.201	0.000000000 F	0.168035887	0.160	483
06/29/16 08:05	10.7	0.220	0.000000000 F	0.165935439	0.158	484
06/29/16 08:06	10.7	0.235	0.000000000 F	0.178538130	0.170	483
06/29/16 08:07	10.7	0.249	0.000000000 F	0.190095988	0.181	484
06/29/16 08:08	10.7	0.205	0.000000000 F	0.213195532	0.203	481
06/29/16 08:09	10.7	0.163	0.000000000 F	0.180241271	0.184	478
06/29/16 08:10	10.6	0.168	0.000000000 F	0.170681264	0.161	476
06/29/16 08:11	10.6	0.176	0.000000000 F	0.133578641	0.126	476
06/29/16 08:12	10.6	0.224	0.000000000 F	0.111313667	0.105	476
06/29/16 08:13	10.6	0.285	0.000000000 F	0.124035452	0.117	478
06/29/16 08:14	10.6	0.287	0.000000000 F	0.163260339	0.154	479
06/29/16 08:15	10.7	0.243	0.000000000 F	0.155433196	0.148	480
06/29/16 08:16	10.6	0.221	0.000000000 F	0.155539415	0.147	481
06/29/16 08:17	10.7	0.193	0.000000000 F	0.157533644	0.150	482
06/29/16 08:18	10.7	0.214	0.000000000 F	0.175387457	0.167	484
06/29/16 08:19	10.6	0.228	0.000000000 F	0.163260339	0.154	485
06/29/16 08:20	10.6	0.217	0.000000000 F	0.158019811	0.150	486
06/29/16 08:21	10.7	0.202	0.000000000 F	0.147031401	0.140	485
06/29/16 08:22	10.6	0.223	0.000000000 F	0.146298226	0.138	484
06/29/16 08:23	10.5	0.242	0.000000000 F	0.126286971	0.118	481
06/29/16 08:24	10.5	0.247	0.000000000 F	0.114514457	0.107	479
06/29/16 08:25	10.5	0.246	0.000000000 F	0.112374000	0.105	479
06/29/16 08:26	10.6	0.241	0.000000000 F	0.122975320	0.116	479
06/29/16 08:27	10.6	0.231	0.000000000 F	0.105133471	0.102	480
06/29/16 08:28	10.5	0.218	0.000000000 F	0.10601485	0.094	480
06/29/16 08:29	10.5	0.199	0.000000000 F	0.119865600	0.112	481
06/29/16 08:30	10.5	0.190	0.000000000 F	0.158393808	0.148	482
06/29/16 08:31	10.6	0.175	0.000000000 F	0.159019811	0.150	483
06/29/16 08:32	10.7	0.207	0.000000000 F	0.168035887	0.160	483
06/29/16 08:33	10.7	0.233	0.000000000 F	0.152282523	0.145	484
06/29/16 08:34	10.6	0.216	0.000000000 F	0.148418490	0.140	485
06/29/16 08:35	10.6	0.185	0.000000000 F	0.133576841	0.126	485
06/29/16 08:36	10.6	0.202	0.000000000 F	0.131456377	0.124	484
06/29/16 08:37	10.6	0.215	0.000000000 F	0.138275881	0.121	484
06/29/16 08:38	10.5	0.228	0.000000000 F	0.136989257	0.128	482
06/29/16 08:39	10.5	0.236	0.000000000 F	0.129497657	0.121	480
06/29/16 08:40	10.5	0.217	0.000000000 F	0.132708342	0.124	479
06/29/16 08:41	10.5	0.185	0.000000000 F	0.114514457	0.107	479
06/29/16 08:42	10.6	0.192	0.000000000 F	0.106013207	0.100	481
06/29/16 08:43	10.6	0.183	0.000000000 F	0.157869679	0.149	482
06/29/16 08:44	10.6	0.184	0.000000000 F	0.232168924	0.219	484
06/29/16 08:45	10.6	0.171	0.000000000 F	0.238529717	0.225	483
06/29/16 08:46	10.6	0.183	0.000000000 F	0.244805059	0.231	484
06/29/16 08:47	10.6	0.149	0.000000000 F	0.194004169	0.183	484
06/29/16 08:48	10.6	0.184	0.000000000 F	0.146288226	0.138	484
06/29/16 08:49	10.6	0.212	0.000000000 F	0.172801528	0.163	484
06/29/16 08:50	10.6	0.218	0.000000000 F	0.225898132	0.213	484
06/29/16 08:51	10.6	0.219	0.000000000 F	0.167500887	0.158	485
06/29/16 08:52	10.6	0.221	0.000000000 F	0.103574803	0.098	485
06/29/16 08:53	10.7	0.217	0.000000000 F	0.137579383	0.131	485
06/29/16 08:54	10.7	0.239	0.000000000 F	0.202693289	0.193	484
06/29/16 08:55	10.6	0.256	0.000000000 F	0.138877301	0.131	481
06/29/16 08:56	10.4	0.250	0.000000000 F	0.063426478	0.059	478
06/29/16 08:57	10.5	0.239	0.000000000 F	0.087437674	0.082	476
06/29/16 08:58	10.5	0.252	0.000000000 F	0.143410628	0.134	477
-----						
Average	10.6	0.214	0.000000000	0.156368239	0.147	482
Minimum	10.4	0.149	0.000000000	0.063426478	0.059	478
Maximum	10.7	0.285	0.000000000	0.244805059	0.231	486
Summation	636.5	12.867	0.000000000	9.321914365	8.810	28,908
-----						
Included Data	60	60	0	60	60	60
Excluded Data						
Total number of Data Points	60	60	60	60	60	60

F = Unit Offline

E = Exceedance

I = Invalid

M = Maintenance

C = Calibration

S = Substituted

T = Out Of Control

Report Generated: 06/29/16 09:00 Project PC16-0031: Huntington Unit 1 Hg RATA

# Average Data

Plant: HUNTINGTON PLANT

Interval: 1 Minute

Type: Block

Report Period: 06/29/2016 09:02 Through 06/29/2016 10:01

Time Online Criteria: 1 minute(s)

R-7

Source Parameter (Unit)	UNIT1					
	CO2 (PCT)	HGO (UG/M3)	HGLB/MM (LB/MMBTU)	HGLB/T (LB/TBTU)	HGT (UG/SCM)	UNITLOAD (MW)
06/29/16 09:02	10.7	0.203	0.000000000 F	0.182730028	0.174	486
06/29/16 09:03	10.7	0.203	0.000000000 F	0.154382972	0.147	486
06/29/16 09:04	10.8	0.178	0.000000000 F	0.134636773	0.127	486
06/29/16 09:05	10.6	0.147	0.000000000 F	0.123381113	0.122	485
06/29/16 09:06	10.6	0.176	0.000000000 F	0.140997566	0.133	482
06/29/16 09:07	10.6	0.200	0.000000000 F	0.145230094	0.137	478
06/29/16 09:08	10.5	0.212	0.000000000 F	0.163744871	0.153	476
06/29/16 09:09	10.5	0.218	0.000000000 F	0.149832000	0.140	476
06/29/16 09:10	10.5	0.243	0.000000000 F	0.144480857	0.135	477
06/29/16 09:11	10.8	0.282	0.000000000 F	0.152669018	0.144	478
06/29/16 09:12	10.7	0.239	0.000000000 F	0.175367457	0.167	482
06/29/16 09:13	10.7	0.211	0.000000000 F	0.127077140	0.121	483
06/29/16 09:14	10.8	0.216	0.000000000 F	0.077829400	0.075	485
06/29/16 09:15	10.7	0.216	0.000000000 F	0.107122878	0.102	487
06/29/16 09:16	10.6	0.270	0.000000000 F	0.163260039	0.154	485
06/29/16 09:17	10.7	0.319	0.000000000 F	0.181734542	0.154	484
06/29/16 09:18	10.6	0.269	0.000000000 F	0.165380603	0.156	484
06/29/16 09:19	10.6	0.214	0.000000000 F	0.178102188	0.168	482
06/29/16 09:20	10.6	0.200	0.000000000 F	0.207785888	0.196	481
06/29/16 09:21	10.7	0.198	0.000000000 F	0.171186560	0.163	479
06/29/16 09:22	10.7	0.225	0.000000000 F	0.121828018	0.116	478
06/29/16 09:23	10.6	0.247	0.000000000 F	0.112374000	0.106	481
06/29/16 09:24	10.6	0.241	0.000000000 F	0.121915188	0.115	485
06/29/16 09:25	10.8	0.226	0.000000000 F	0.147751000	0.142	488
06/29/16 09:26	10.7	0.228	0.000000000 F	0.184251485	0.185	489
06/29/16 09:27	10.7	0.223	0.000000000 F	0.166985663	0.159	489
06/29/16 09:28	10.7	0.206	0.000000000 F	0.144930953	0.138	485
06/29/16 09:29	10.7	0.176	0.000000000 F	0.131278037	0.125	479
06/29/16 09:30	10.7	0.214	0.000000000 F	0.136729607	0.132	473
06/29/16 09:31	10.7	0.256	0.000000000 F	0.139679831	0.133	470
06/29/16 09:32	10.7	0.212	0.000000000 F	0.154382972	0.147	471
06/29/16 09:33	10.7	0.164	0.000000000 F	0.142833504	0.136	476
06/29/16 09:34	10.8	0.169	0.000000000 F	0.136306500	0.131	482
06/29/16 09:35	10.9	0.183	0.000000000 F	0.166045522	0.163	484
06/29/16 09:36	10.8	0.228	0.000000000 F	0.224748000	0.216	486
06/29/16 09:37	10.9	0.261	0.000000000 F	0.214436458	0.208	486
06/29/16 09:38	10.8	0.254	0.000000000 F	0.203938000	0.196	485
06/29/16 09:39	10.8	0.233	0.000000000 F	0.174804000	0.168	484
06/29/16 09:40	10.8	0.215	0.000000000 F	0.142548500	0.137	482
06/29/16 09:41	10.8	0.189	0.000000000 F	0.136306500	0.131	482
06/29/16 09:42	10.8	0.177	0.000000000 F	0.148710500	0.141	482
06/29/16 09:43	10.9	0.160	0.000000000 F	0.180416972	0.175	484
06/29/16 09:44	10.9	0.191	0.000000000 F	0.229902770	0.223	485
06/29/16 09:45	10.9	0.212	0.000000000 F	0.224748000	0.219	487
06/29/16 09:46	10.8	0.209	0.000000000 F	0.222667000	0.214	486
06/29/16 09:47	10.9	0.194	0.000000000 F	0.184540789	0.179	484
06/29/16 09:48	10.8	0.202	0.000000000 F	0.144623500	0.139	482
06/29/16 09:49	10.7	0.207	0.000000000 F	0.136529158	0.130	479
06/29/16 09:50	10.7	0.256	0.000000000 F	0.144930953	0.138	478
06/29/16 09:51	10.7	0.296	0.000000000 F	0.141780280	0.135	470
06/29/16 09:52	10.7	0.255	0.000000000 F	0.150182074	0.143	478
06/29/16 09:53	10.8	0.206	0.000000000 F	0.115495500	0.111	479
06/29/16 09:54	10.8	0.208	0.000000000 F	0.088962750	0.085	480
06/29/16 09:55	10.9	0.203	0.000000000 F	0.079795849	0.077	481
06/29/16 09:56	10.9	0.202	0.000000000 F	0.087218719	0.085	483
06/29/16 09:57	10.9	0.196	0.000000000 F	0.109281137	0.106	480
06/29/16 09:58	11.0	0.197	0.000000000 F	0.145064518	0.142	492
06/29/16 09:59	11.0	0.193	0.000000000 F	0.159060783	0.156	497
06/29/16 10:00	10.9	0.210	0.000000000 F	0.181447806	0.178	498
06/29/16 10:01	10.8	0.224	0.000000000 F	0.158156000	0.152	495
Average						
Minimum						
Maximum						
Summation						
Included Data						
Total number of						
Points Excluded						

F = Unit Offline

E = Exceedance

I = Invalid

M = Maintenance

C = Calibration

S = Substituted

T = Out Of Control

Project PC16-0031: Huntington Unit 1 Hg RATA

Report Generated: 06/29/16 10:02

# Average Data

Plant: HUNTINGTON PLANT

Interval: 1 Minute

Type: Block

Report Period: 06/29/2016 10:05 Through 06/29/2016 11:04

Time Online Criteria: 1 minute(s)

R-8

Source Parameter (Unit)	UNIT1					
	CO2 (PCT)	HGO (UG/M3)	HGLB/MM (LB/MMBTU)	HGLB/T (LB/TBTU)	HGT (UG/SCM)	UNIT/LOAD (MW)
06/29/16 10:05	10.6	0.211	0.000000000 F	0.110253735	0.104	462
06/29/16 10:06	10.5	0.244	0.000000000 F	0.143410628	0.134	463
06/29/16 10:07	10.6	0.272	0.000000000 F	0.172601528	0.163	469
06/29/16 10:08	10.6	0.243	0.000000000 F	0.214446679	0.202	474
06/29/16 10:09	10.7	0.213	0.000000000 F	0.237350691	0.226	476
06/29/16 10:10	10.8	0.244	0.000000000 F	0.284026500	0.273	479
06/29/16 10:11	10.8	0.275	0.000000000 F	0.240355500	0.231	481
06/29/16 10:12	10.8	0.275	0.000000000 F	0.193533000	0.166	481
06/29/16 10:13	10.8	0.289	0.000000000 F	0.148832000	0.144	482
06/29/16 10:14	10.8	0.252	0.000000000 F	0.118817000	0.114	484
06/29/16 10:15	10.8	0.229	0.000000000 F	0.134224500	0.129	485
06/29/16 10:16	10.8	0.207	0.000000000 F	0.165439500	0.159	486
06/29/16 10:17	10.8	0.172	0.000000000 F	0.177925500	0.171	485
06/29/16 10:18	10.8	0.196	0.000000000 F	0.192489500	0.185	483
06/29/16 10:19	10.8	0.214	0.000000000 F	0.180006500	0.173	481
06/29/16 10:20	10.7	0.215	0.000000000 F	0.176437602	0.168	480
06/29/16 10:21	10.7	0.210	0.000000000 F	0.172236785	0.164	480
06/29/16 10:22	10.6	0.213	0.000000000 F	0.181282584	0.171	479
06/29/16 10:23	10.6	0.211	0.000000000 F	0.146288228	0.138	480
06/29/16 10:24	10.6	0.220	0.000000000 F	0.114494284	0.108	481
06/29/16 10:25	10.6	0.223	0.000000000 F	0.147358358	0.139	481
06/29/16 10:26	10.6	0.223	0.000000000 F	0.225868132	0.213	482
06/29/16 10:27	10.6	0.217	0.000000000 F	0.198124434	0.185	484
06/29/16 10:28	10.7	0.225	0.000000000 F	0.158833889	0.151	484
06/29/16 10:29	10.6	0.228	0.000000000 F	0.147358358	0.138	483
06/29/16 10:30	10.6	0.222	0.000000000 F	0.148418490	0.140	482
06/29/16 10:31	10.6	0.212	0.000000000 F	0.169621132	0.160	482
06/29/16 10:32	10.5	0.218	0.000000000 F	0.207024342	0.194	480
06/29/16 10:33	10.5	0.220	0.000000000 F	0.205483885	0.192	478
06/29/16 10:34	10.5	0.252	0.000000000 F	0.208694571	0.195	476
06/29/16 10:35	10.6	0.290	0.000000000 F	0.195064301	0.184	476
06/29/16 10:36	10.5	0.283	0.000000000 F	0.192841142	0.180	476
06/29/16 10:37	10.5	0.270	0.000000000 F	0.173377028	0.162	477
06/29/16 10:38	10.6	0.221	0.000000000 F	0.182200207	0.153	478
06/29/16 10:39	10.6	0.167	0.000000000 F	0.177847522	0.167	479
06/29/16 10:40	10.7	0.176	0.000000000 F	0.202893289	0.193	482
06/29/16 10:41	10.5	0.181	0.000000000 F	0.172306800	0.161	487
06/29/16 10:42	10.5	0.186	0.000000000 F	0.133778571	0.125	489
06/29/16 10:43	10.6	0.186	0.000000000 F	0.153719150	0.145	490
06/29/16 10:44	10.6	0.190	0.000000000 F	0.180244888	0.187	489
06/29/16 10:45	10.5	0.189	0.000000000 F	0.178728171	0.167	484
06/29/16 10:46	10.4	0.214	0.000000000 F	0.158833826	0.147	478
06/29/16 10:47	10.5	0.230	0.000000000 F	0.128427428	0.120	473
06/29/16 10:48	10.4	0.212	0.000000000 F	0.101784811	0.084	473
06/29/16 10:49	10.5	0.185	0.000000000 F	0.159464057	0.149	473
06/29/16 10:50	10.5	0.208	0.000000000 F	0.244012114	0.228	472
06/29/16 10:51	10.5	0.227	0.000000000 F	0.217256400	0.203	473
06/29/16 10:52	10.5	0.213	0.000000000 F	0.184079314	0.172	476
06/29/16 10:53	10.6	0.195	0.000000000 F	0.160079943	0.151	480
06/29/16 10:54	10.6	0.187	0.000000000 F	0.162659018	0.144	482
06/29/16 10:55	10.5	0.173	0.000000000 F	0.148551065	0.136	483
06/29/16 10:56	10.6	0.183	0.000000000 F	0.147358358	0.139	485
06/29/16 10:57	10.7	0.209	0.000000000 F	0.124676691	0.119	486
06/29/16 10:58	10.6	0.217	0.000000000 F	0.113434132	0.107	486
06/29/16 10:59	10.5	0.220	0.000000000 F	0.138059465	0.129	487
06/29/16 11:00	10.5	0.227	0.000000000 F	0.178728171	0.167	486
06/29/16 11:01	10.5	0.229	0.000000000 F	0.154112914	0.144	484
06/29/16 11:02	10.5	0.225	0.000000000 F	0.130567885	0.122	479
06/29/16 11:03	10.4	0.217	0.000000000 F	0.148870096	0.135	477
06/29/16 11:04	10.4	0.222	0.000000000 F	0.177206153	0.164	475

Average	10.6	0.219	0.000000000	0.170375496	0.161	480
Minimum	10.4	0.167	0.000000000	0.101784811	0.084	462
Maximum	10.8	0.290	0.000000000	0.284026500	0.273	490
Summation	635.9	13.167	0.000000000	10.222529767	9.645	28,798
Included Data	60	60	0	60	60	60
Excluded Data	0	0	0	0	0	0
Total number of Data Points	60	60	60	60	60	60

F = Unit Offline

E = Exceedance

I = Invalid

M = Maintenance

C = Calibration

S = Substituted

T = Out Of Control

Project PC16-0031: Huntington Unit 1 Hg RATA

Report Generated: 06/29/16 11:22



# Average Data

Plant: HUNTINGTON PLANT

Interval: 1 Minute

Type: Block

Report Period: 06/29/2016 11:09 Through 06/29/2016 12:08

Time Online Criteria: 1 minute(s)

12-9

Source Parameter (Unit)	UNIT1					
	CO2 (PCT)	H2O (UG/M3)	HGLB/MM (LB/MMBTU)	HGLB/T (LB/TBTU)	HGT (UG/SCM)	UNITLOAD (MW)
06/29/16 11:09	10.5	0.254	0.000000000 F	0.154112914	0.144	485
06/29/16 11:10	10.6	0.215	0.000000000 F	0.130396245	0.123	487
06/29/16 11:11	10.6	0.174	0.000000000 F	0.113434132	0.107	487
06/29/16 11:12	10.5	0.175	0.000000000 F	0.109165314	0.102	483
06/29/16 11:13	10.6	0.171	0.000000000 F	0.109193903	0.103	479
06/29/16 11:14	10.5	0.223	0.000000000 F	0.125216742	0.117	477
06/29/16 11:15	10.5	0.270	0.000000000 F	0.164815200	0.154	476
06/29/16 11:16	10.5	0.255	0.000000000 F	0.220487085	0.208	476
06/29/16 11:17	10.6	0.235	0.000000000 F	0.184462981	0.174	478
06/29/16 11:18	10.6	0.233	0.000000000 F	0.147359358	0.139	480
06/29/16 11:19	10.6	0.226	0.000000000 F	0.136757037	0.129	482
06/29/16 11:20	10.8	0.248	0.000000000 F	0.143117530	0.135	482
06/29/16 11:21	10.6	0.295	0.000000000 F	0.148418490	0.140	481
06/29/16 11:22	10.6	0.235	0.000000000 F	0.166440735	0.157	480
06/29/16 11:23	10.6	0.201	0.000000000 F	0.174821792	0.165	480
06/29/16 11:24	10.6	0.198	0.000000000 F	0.195064301	0.184	480
06/29/16 11:25	10.6	0.184	0.000000000 F	0.164320471	0.155	481
06/29/16 11:26	10.6	0.171	0.000000000 F	0.137817189	0.130	482
06/29/16 11:27	10.6	0.158	0.000000000 F	0.172801528	0.163	484
06/29/16 11:28	10.7	0.167	0.000000000 F	0.252053031	0.240	485
06/29/16 11:29	10.6	0.176	0.000000000 F	0.214146679	0.202	485
06/29/16 11:30	10.6	0.187	0.000000000 F	0.186440735	0.157	485
06/29/16 11:31	10.5	0.195	0.000000000 F	0.203434428	0.190	484
06/29/16 11:32	10.5	0.174	0.000000000 F	0.205460914	0.248	482
06/29/16 11:33	10.5	0.149	0.000000000 F	0.227568685	0.213	491
06/29/16 11:34	10.5	0.169	0.000000000 F	0.183090885	0.171	480
06/29/16 11:35	10.6	0.182	0.000000000 F	0.170881264	0.161	490
06/29/16 11:36	10.6	0.193	0.000000000 F	0.178102188	0.188	490
06/29/16 11:37	10.5	0.200	0.000000000 F	0.227568685	0.213	491
06/29/16 11:38	10.5	0.202	0.000000000 F	0.284312857	0.275	491
06/29/16 11:39	10.5	0.199	0.000000000 F	0.246152571	0.230	481
06/29/16 11:40	10.5	0.204	0.000000000 F	0.180500885	0.178	481
06/29/16 11:41	10.5	0.204	0.000000000 F	0.158383828	0.148	482
06/29/16 11:42	10.6	0.214	0.000000000 F	0.139937434	0.132	483
06/29/16 11:43	10.5	0.220	0.000000000 F	0.141270171	0.132	482
06/29/16 11:44	10.5	0.222	0.000000000 F	0.155183142	0.145	482
06/29/16 11:45	10.5	0.218	0.000000000 F	0.122306627	0.114	482
06/29/16 11:46	10.5	0.239	0.000000000 F	0.097390800	0.091	483
06/29/16 11:47	10.6	0.281	0.000000000 F	0.114484284	0.108	482
06/29/16 11:48	10.5	0.238	0.000000000 F	0.154112914	0.144	482
06/29/16 11:49	10.5	0.200	0.000000000 F	0.135919028	0.127	483
06/29/16 11:50	10.5	0.259	0.000000000 F	0.1113003771	0.104	483
06/29/16 11:51	10.5	0.315	0.000000000 F	0.148832000	0.140	483
06/29/16 11:52	10.5	0.256	0.000000000 F	0.212975485	0.199	482
06/29/16 11:53	10.5	0.193	0.000000000 F	0.191570914	0.179	491
06/29/16 11:54	10.4	0.205	0.000000000 F	0.165561000	0.156	481
06/29/16 11:55	10.4	0.214	0.000000000 F	0.162077884	0.150	483
06/29/16 11:56	10.4	0.185	0.000000000 F	0.169641519	0.157	485
06/29/16 11:57	10.4	0.152	0.000000000 F	0.172863076	0.168	485
06/29/16 11:58	10.4	0.204	0.000000000 F	0.188929826	0.173	482
06/29/16 11:59	10.4	0.252	0.000000000 F	0.159916846	0.148	484
06/29/16 12:00	10.5	0.209	0.000000000 F	0.135919028	0.127	478
06/29/16 12:01	10.4	0.161	0.000000000 F	0.116596076	0.106	473
06/29/16 12:02	10.5	0.188	0.000000000 F	0.105031560	0.099	472
06/29/16 12:03	10.5	0.230	0.000000000 F	0.164815200	0.154	474
06/29/16 12:04	10.6	0.248	0.000000000 F	0.245950641	0.232	474
06/29/16 12:05	10.6	0.260	0.000000000 F	0.175981924	0.196	474
06/29/16 12:06	10.6	0.236	0.000000000 F	0.092337503	0.087	478
06/29/16 12:07	10.6	0.209	0.000000000 F	0.086062724	0.081	481
06/29/16 12:08	10.7	0.204	0.000000000 F	0.103762160	0.099	480

Average	10.5	0.211	0.000000000	0.164183405	0.154	481
Minimum	10.4	0.149	0.000000000	0.086062724	0.081	472
Maximum	10.7	0.315	0.000000000	0.294312857	0.275	487
Summation	632.1	12.689	0.000000000	9.851004309	9.234	28.580

Included Data Points	60	60	0	60	60	60
Total number of Data Points	60	60	60	60	60	60

F = Unit Offline

E = Exceedance

I = Invalid

M = Maintenance

C = Calibration

S = Substituted

T = Out Of Control

Report Generated: 06/29/16 12:10

**Mercury Calibration Standard Certificates**

**Dry Gas Meter Pre-Test and Post-Test  
Calibrations**

**Reference Meter Calibration Certificate**



Ohio Lumex Company, Inc.

9263 Ravenna Rd. Unit A-3

Twinsburg, Ohio 44087

Toll Free (888) 876 2611, (330) 405 0837, Fax. (330) 405 0847

www.ohiolumex.com

*Certified Reference Material (Mercury Standard) Certificate of Analysis*

**1.0 ACCREDITATION / REGISTRATION**

The certified reference material manufacturer is accredited to ISO Guide 34, "General Requirements for the Competence of Reference Material Producers" (A2LA certificate number 883.02) and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories" (A2LA certificate number 883.01) and it's also ISO 9001 registered (SAI Global File Number 010105).

**2.0 PRODUCT DESCRIPTION**

Product Code: Multi Analyte Custom Grade Solution  
Catalog Number: RPM-039  
Lot Number: H2-MEB533093  
Matrix: 10% (v/v) HCl  
Value / Analyte(s): 0.1 µg/mL ea:  
Hg

**3.0 CERTIFIED VALUES AND UNCERTAINTIES**

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Mercury	0.1000 ± 0.0006 µg/mL				

Certified Density: 1.020 g/mL (measured at 20 ± 1 °C)

**Assay Information:**

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Hg	ICP Assay	3133	061204
Hg	EDTA	928	928

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of  $k = 2$ .

$$\text{Certified Value } (\bar{x}) = \frac{\sum x_i}{n}$$

$(\bar{x})$  = mean

$x_i$  = individual results

$n$  = number of measurements

$$\text{Uncertainty } (\pm) = 2 [\sum (s_i)^2]^{1/2}$$

2 = the coverage factor.

$[\sum (s_i)^2]^{1/2}$  = The square root of the sum of the squares of the most common errors (where 's' stands for the standard deviation) from instrumental measurement, density, NIST SRM uncertainty, weighing, dilution to volume, homogeneity, long term stability and short term stability.

**4.0 TRACEABILITY TO NIST**

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.



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*Certified Reference Material (Mercury Standard) Certificate of Analysis*

**1.0** This Certified Reference Material is distributed by Ohio Lumex and has been manufactured under ISO Guide 34, ISO 17025 and ISO 9001 guidelines by an accredited/registered laboratory. A2LA accredited Reference Material Producer Certificate Number 0883.02. A2LA accredited Testing Laboratory Certificate Number 0883.01. SAI Global registered Quality Management System File Number 010105.

**2.0 DESCRIPTION OF CRM**      **1 µg/mL Mercury in 10% v/v HCl**  
Catalog No.:                      RPM-043  
Lot Number:                        **G2-MEB484113**  
Matrix:                              10% HCl(v/v)

1 µg/mL ea:

Hg

**3.0 CERTIFIED VALUES AND UNCERTAINTIES**

ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE
Mercury, Hg	1.001 ± 0.007 µg/mL				
<b>Certified Density:</b> 1.020		g/mL (measured at 20 ± 1° C)			

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

$$\text{Certified Value } (\bar{x}) = \frac{\sum x_i}{n}$$

(  $\bar{x}$  ) = mean

$x_i$  = individual results

n = number of measurements

$$\text{Uncertainty } (\pm) = 2 [ \sum (s_i)^2 ]^{1/2}$$

2 = the coverage factor.

$[ \sum (s_i)^2 ]^{1/2}$  = The square root of the sum of the squares of the most common errors (where 's' stands for the standard deviation) from instrumental measurement, density, NIST SRM uncertainty, weighing, dilution to volume, homogeneity, long term stability and short term stability.

**4.0 TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

- "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)
- This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.
- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a NIST SRM/RM. See section 4.2 for balance traceability.



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### Certified Reference Material (Mercury Standard) Certificate of Analysis

**1.0** This Certified Reference Material is distributed by Ohio Lumex and has been manufactured under ISO Guide 34, ISO 17025 and ISO 9001 guidelines by an accredited/registered laboratory. A2LA accredited Reference Material Producer Certificate Number 0883.02. A2LA accredited Testing Laboratory Certificate Number 0883.01. SAI Global registered Quality Management System File Number 010105.

**2.0 DESCRIPTION OF CRM 10 µg/mL Mercury in 10% (v/v) HCL**

Catalog Number: RPM-042  
Lot Number: G2-HG02119MCA  
Starting Material: Hg metal  
Starting Material Purity (%): 99.9997  
Starting Material Lot No: 1780  
Matrix: 10% (v/v) HCL

**3.0 CERTIFIED VALUES AND UNCERTAINTIES**

**Certified Concentration:** 9.991 ± 0.073 µg/mL

**Certified Density:** 1.024 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence interval using a coverage factor of k = 2.

**Characterization of CRM by two independent methods**

Certified Value,  $X_{CRM}$ , where two methods of characterization are used, is the weighted mean of the two results =  $[(w_a)(X_a) + (w_b)(X_b)]$

$X_a$  is the mean of Assay Method A with standard uncertainty  $U_{char a}$ .

$X_b$  is the mean of Assay Method B with standard uncertainty  $U_{char b}$ .

$w_a$  and  $w_b$  = The weighting factors for each method calculated using the inverse square of the variance:

$$w_a = (1/U_{char a}^2) / ((1/U_{char a}^2) + (1/U_{char b}^2));$$
$$w_b = (1/U_{char b}^2) / ((1/U_{char a}^2) + (1/U_{char b}^2))$$

CRM Expanded Uncertainty ( $\pm$ ) =  $U_{CRM} = k (U_{char a}^2 + U_{char b}^2 + U_{HS}^2 + U_{STS}^2)^{1/2}$

$U_{char a}^2 = [(w_a)^2 (U_{char a})^2 + (w_b)^2 (U_{char b})^2]^{1/2}$ ;  $U_{char a}$  and  $U_{char b}$  are the square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume; k, coverage factor = 2 in all cases at Inorganic Ventures;  $U_{bb}$  = bottle to bottle homogeneity standard uncertainty;  $U_{HS}$  = long term stability standard uncertainty (storage);  $U_{STS}$  = short term stability standard uncertainty (transportation).

**Characterization of CRM by one method**

Certified Value,  $X_{CRM}$ , where one method of characterization is used, is the mean of individual results:

$X_a$  = Mean  $X_a$  is the mean of Assay Method A with standard uncertainty  $U_{char a}$ .

CRM Expanded Uncertainty ( $\pm$ ) =  $U_{CRM} = k (U_{char a}^2 + U_{bb}^2 + U_{HS}^2 + U_{STS}^2)^{1/2}$

$U_{char a}$  is the square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume; k, coverage factor = 2 in all cases at Inorganic Ventures;  $U_{bb}$  = bottle to bottle homogeneity standard uncertainty;  $U_{HS}$  = long term stability standard uncertainty (storage);  $U_{STS}$  = short term stability standard uncertainty (transportation).

**4.0 TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

• "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

• This product is Traceable to NIST via an unbroken chain of comparisons to the following NIST SRMs:



### Meter Console Information

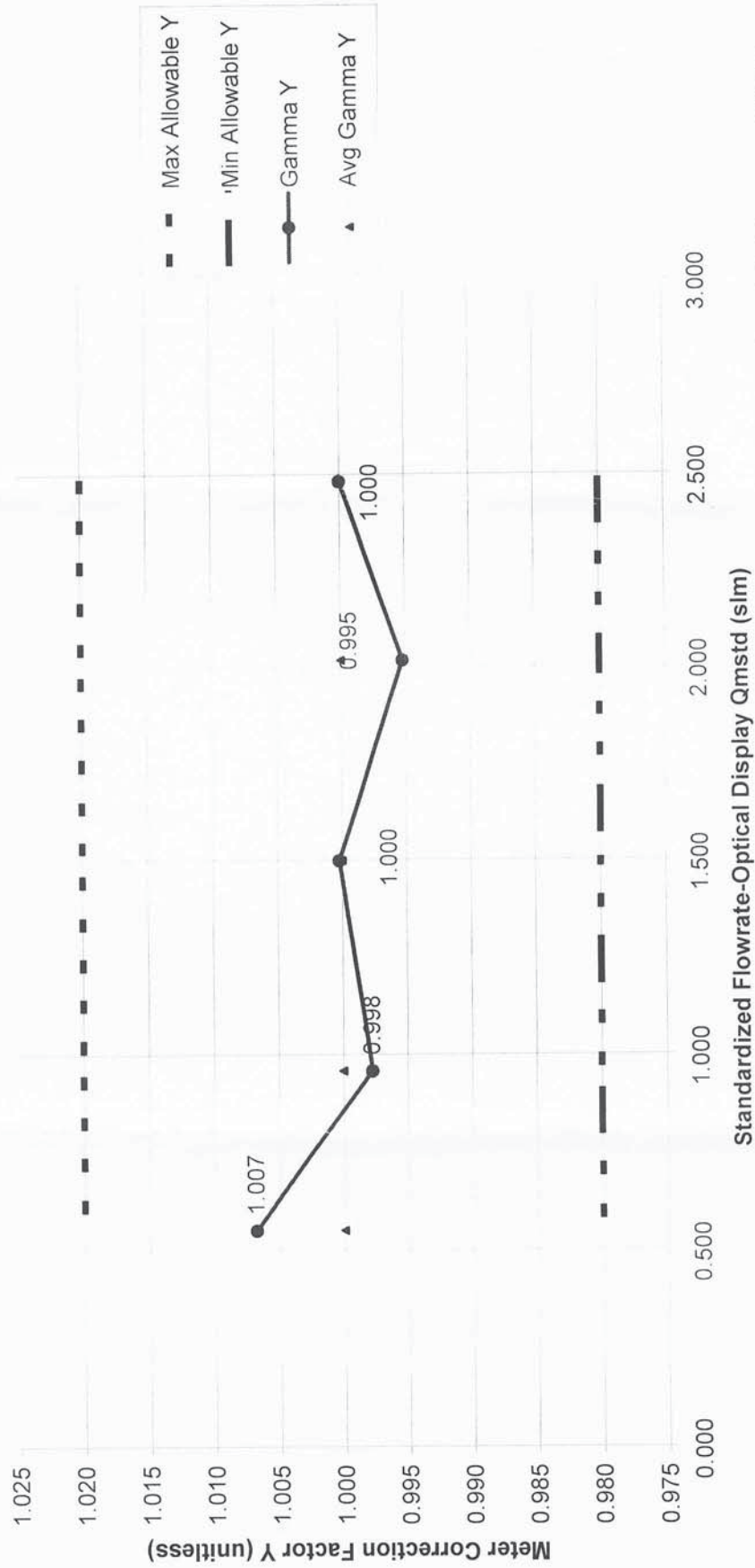
Calibration Conditions				
WTM ID	539783	Calibration Technician	EW	
WTM Cal Factor	1.0001	Barometric Pressure	754	mm Hg
			Calibration Date	
			15-Sep-09	

Average Meter Calibration Factor Y

to certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR 40 Part 60, using a Precision Wet Test Meter, which in turn was calibrated using the American Bell Prover # 3785, certificate # F-107, which is traceable to the National Bureau of Standards (N.I.S.).

Date 2/15/02

# Electronic Totalizer Y vs Standardized Flowrate



Console Serial: 909012-A



## APEX INSTRUMENTS METER CONSOLE CALIBRATION

## Meter Console Information

Console Model	XC-260	Console Serial Number	909012-B	Encoder Model	HEDS-9100-F00
Gas Meter Model	SK25	Totalizer Scale Factor (Initial)	1.0000	Totalizer Model	RED LION
Gas Meter Serial#	8005121	Totalizer Scale Factor (Final)	0.9765	Temp Display Model	JENCO

## Calibration Conditions

WTM ID	539784	Calibration Technician	EW	Calibration Date	15-Sep-09
WTM Cal Factor	1.0024	Barometric Pressure (Pb)	754 mm Hg		

## Calibration Data

Run Time	Dry Gas Meter				Wet Test Meter				Standardized Volumes				Results		
	Gas Pressure	Gas Volume	Gas Temp	Gas Temp	Gas Volume	Gas Temp	Gas Temp	Gas Temp	Totalizer	Initial SF	Final SF	Wet Test Meter	Totalizer Gamma	Corrected Flowrate	
	(P <sub>m</sub> )	(V <sub>m</sub> )	(t <sub>m</sub> )	(t <sub>m</sub> )	(V <sub>w</sub> )	(t <sub>w</sub> )	(t <sub>w</sub> )	(t <sub>w</sub> )	(V <sub>m(stg)</sub> )	(V <sub>m(stg)</sub> )	(V <sub>w(stg)</sub> )	(V <sub>w(stg)</sub> )	Final	Variation	(Q <sub>m</sub> )
	mm H <sub>2</sub> O	liters	°C	°C	liters	°C	°C	°C	std liters	std liters	std liters	std liters	(Y)	(ΔY)	slm
Run 1 - Initial	0	0	23.89	0.000	449.028	23.5									
Final	0	0	24.44	14.190	462.731	24									
Total/Avg	0	0	24.17	14.190	13.703	23.75	13.891	13.564	13.465	0.993	-0.007	2.70			
Run 2 - Initial	0	0	24.40	14.190	462.731	24									
Final	0	0	24.44	27.087	475.192	24									
Total/Avg	0	0	24.42	12.897	12.461	24	12.614	12.317	12.234	0.993	-0.007	2.04			
Run 3 - Initial	0	0	24.44	27.087	475.192	24									
Final	0	0	25.00	38.163	485.960	24									
Total/Avg	0	0	24.72	11.076	10.768	24	10.822	10.568	10.572	1.000	0.000	1.51			
Run 4 - Initial	0	0	25.00	38.163	485.960	24									
Final	0	0	25.00	50.813	498.303	24.0									
Total/Avg	0	0	25.00	12.650	12.343	24.0	12.348	12.058	12.118	1.005	0.005	1.01			
Run 5 - Initial	0	0	25.00	50.813	498.303	24.0									
Final	0	0	25.56	66.847	513.990	24.0									
Total/Avg	0	0	25.28	16.034	15.687	24.0	15.637	15.269	15.401	1.009	0.009	0.64			

Average Meter Calibration Factor Y

1.000

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is  $\pm 0.02$ .

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR 40 Part 60, using a Precision Wet Test Meter, which in turn was calibrated using the American Bell Prover # 3785, certificate # F107, which is traceable to the National Bureau of Standards (N.I.S.T.).

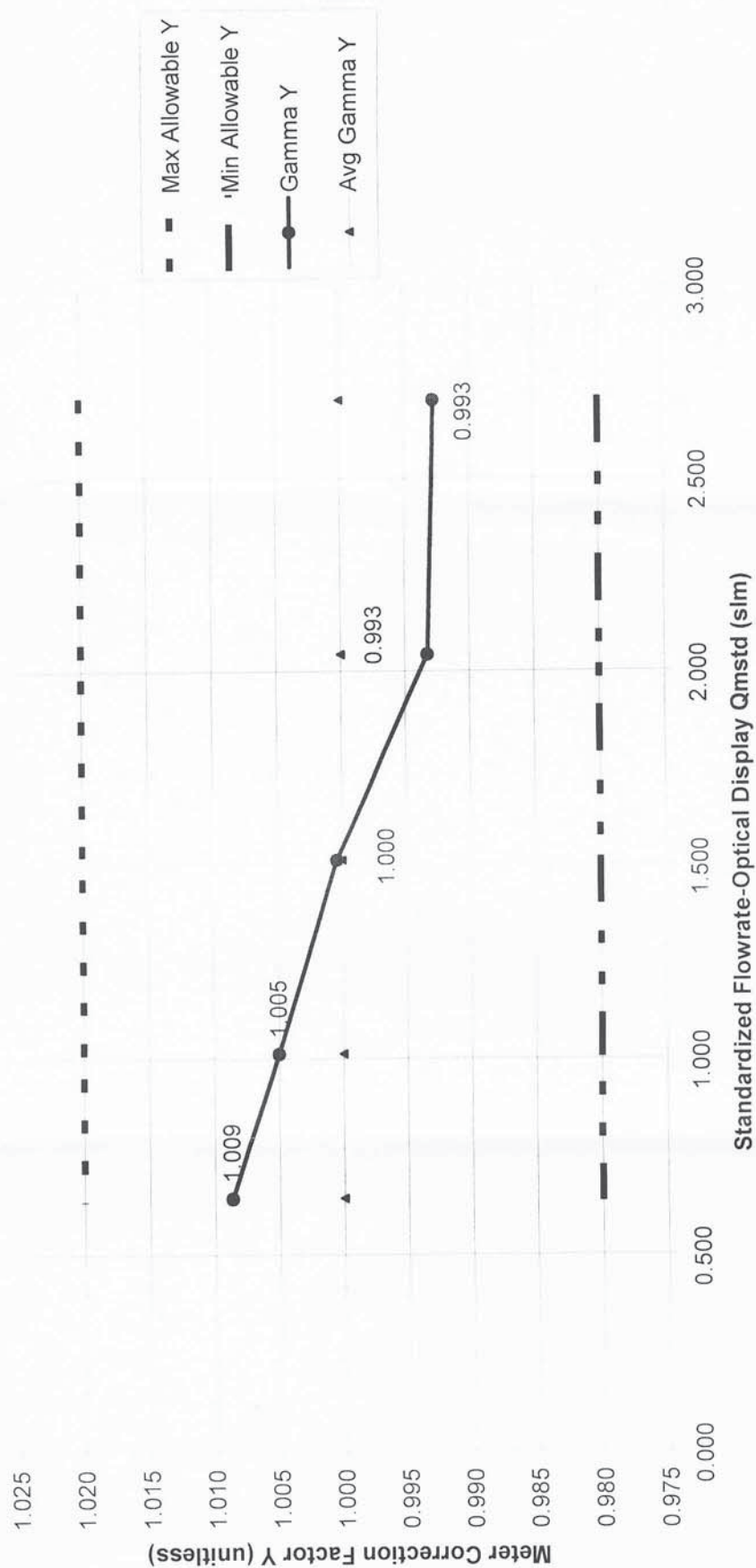
Signature *Carla White*

Date

9/15/09



# Electronic Totalizer Y vs Standardized Flowrate



Console Serial: 909012-B

## Temperature Sensor Calibration Data Sheet

Unit	XC-260	Serial #	0909012
Date	9/15/2009	Thermocouple No	Model Altek Series 22 Type K
Personnel	EW	Reference	105795
Ambient temp		ASTM Mercury-In-Glass ID	
		NIST Reference TC ID	90728323

Date	Reference Point Number	Source (specify)	Reference Thermometer Temperature F	Thermocouple Display Temperature F	Absolute Temperature Difference %
	1		100	98	0.4
	2		200	200	0.0
	3		300	300	0.0
	1		500	498	0.2
	2		700	701	-0.1
	3		900	901	-0.1
	1		1100	1101	-0.1
	2		1500	1501	-0.1
	3		1900	1902	-0.1
	1				
	2				
	3				
	1				
	2				
	3				
	1				
	2				
	3				
	1				
	2				
	3				
	1				
	2				
	3				
					<b>0.023</b>
					<1.5

Checked By *EW 9/15/09*  
(Personnel (Sign/Date))

\_\_\_\_\_  
Team Leader (Signature/Date)

# METHOD 30B DRY GAS METER POST-CALIBRATION USING METRIC REFERENCE METER



- 1) Connect meterbox to Reference Meter.
- 2) Record barometric pressure before and after calibration procedure.
- 3) Run at maximum tested sample rate for a period of 20 minutes.
- 4) Record data and information in the **GREEN** cells; **YELLOW** cells are calculated.
- 5) If the Post-Cal Y differs from the Pre-Cal by less than 5%, no adjustments are necessary.

DATE: 6/30/2016	METER ID #: 30B-1A	INITIAL 24.63	FINAL 24.63
OPERATOR: ws	REFERENCE METER Y: 0.9965	BAROMETRIC PRESSURE (in Hg):	

RUN #	REFERENCE METER		30B DRY GAS METER				ELAPSED TIME (MIN) $\theta$	(1) $V_{cr}$ (STD) (m <sup>3</sup> )		(2) $V_m$ (STD) (m <sup>3</sup> )		(3) Y (unitless)	
	DGM TEMP. (°F)	DGM READINGS (m <sup>3</sup> )	INITIAL	FINAL	NET (V <sub>cr</sub> )	FLOW RATE (LPM)		INITIAL	FINAL	INITIAL	FINAL	Y	(unitless)
1	66	12.0606 12.0656	0.0050			1	5.00	0.0041	0.0042	0.0041	0.0042	0.974	
2	66	12.0656 12.0708	0.0052			1	5.00	0.0043	0.0042	0.0043	0.0042	1.026	
3	66	12.0708 12.0758	0.0050			1	5.00	0.0041	0.0042	0.0041	0.0042	0.982	

AVERAGE DRY GAS METER CALIBRATION FACTOR, Y = **0.994**

PRE-TEST CALIBRATION FACTOR, Y = 1.000  
DIFFERENCE = 0.59% (<5%)

DATE: 6/30/2016	METER ID #: 30B-1B	INITIAL 24.63	FINAL 24.63
OPERATOR: ss	REFERENCE METER Y: 0.9965	BAROMETRIC PRESSURE (in Hg):	

RUN #	REFERENCE METER		30B DRY GAS METER				ELAPSED TIME (MIN) $\theta$	(1) $V_{cr}$ (STD) (m <sup>3</sup> )		(2) $V_m$ (STD) (m <sup>3</sup> )		(3) Y (unitless)	
	DGM TEMP. (°F)	DGM READINGS (m <sup>3</sup> )	INITIAL	FINAL	NET (V <sub>cr</sub> )	FLOW RATE (LPM)		INITIAL	FINAL	INITIAL	FINAL	Y	(unitless)
1	66	12.0454 12.0504	0.0050			1	5.00	0.0041	0.0042	0.0041	0.0042	0.986	
2	66	12.0504 12.0556	0.0052			1	5.00	0.0043	0.0042	0.0043	0.0042	1.014	
3	59	12.0556 12.0606	0.0050			1	5.00	0.0042	0.0042	0.0042	0.0042	0.994	

AVERAGE DRY GAS METER CALIBRATION FACTOR, Y = **0.998**

PRE-TEST CALIBRATION FACTOR, Y = 1.000  
DIFFERENCE = 0.20% (<5%)

**APEX INSTRUMENTS REFERENCE METER VERIFICATION  
USING SHINAGAWA WET-TEST METER W-NK-1A**

**2-POINT METRIC UNITS**

Calibration Meter Information	
WTM Model #	W-NK-1A
WTM Serial #	541008
WTM Gamma	1.0006
Original 15Pt Gamma	0.9965

Calibration Conditions	
Date	6-Jan-16
Time	11:45
Barometric Pressure	764
Calibration Technician	EW
DGM Serial Number	SK25-8005211

Factors/Conversions	
Std Temp	293
Std Press	760
K <sub>1</sub>	0.3858
	K/mm Hg

Calibration Data										Results	
Dry Gas Meter					Calibration Meter					Dry Gas Meter	
Run Time	Meter Pressure (P <sub>m</sub> )	Volume Initial (V <sub>mi</sub> )	Volume Final (V <sub>mf</sub> )	Sample Volume (V)	Temp Initial (t <sub>mi</sub> )	Temp Final (t <sub>mf</sub> )	Meter Pressure (P <sub>m</sub> )	Volume Initial (V <sub>mi</sub> )	Volume Final (V <sub>mf</sub> )	Temp Initial (t <sub>mi</sub> )	Temp Final (t <sub>mf</sub> )
6	-73	249.2	275.2	0.026	22 °C	22 °C	220 Pascals	L	700.093	22 °C	22 °C
								L	725.681		
								m <sup>3</sup>	0.025588		
										Variation	0.30%
											must be < 1.5%
24	-30	275.2	288.3	0.0131	22	22	200	725.681	738.662	22	22
										Variation	0.51%
											must be < 1.5%

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR 40 Part 60, using a Wet Test Meter, which in turn was calibrated using the American Bell Prover #3785, certificate #F107, which is traceable to the National Bureau of Standards (N.I.S.T.).

Signature

Date

## RE: Certification of Air Emission Testing Body (AETB) Conformance

To Whom it May Concern:

This letter is to confirm that Emissions Measurement Company LLC ("EMCo") is an Air Emission Testing Body (AETB) operating in conformance with ASTM D7036-04, as required by 40 CFR Part 75, Appendix A §6.1.2. The table below lists the EPA Reference Methods for which each listed Project Manager is a Qualified Individual and other relevant information required by (as applicable) 40 CFR Part 75.59(a)(15), 40 CFR Part 75.59(b)(6) and 40 CFR Part 75.59(d)(4).

### Emissions Measurement Company (800) 984-9883

#### AETB Qualified Individual Information

QI Name	QI Email	Exam*	Exam Date	Exam Provider	Provider Email
Andrew Bruning	abruning@stacktest.us	SES Group 1	6/12/2014	SES	QSTIprogram@gmail.com
		SES Group 2	9/18/2015		
		SES Group 3	6/12/2015		
		EPA Method 30B	1/16/2015*	Ohio-Lumex	andrew.mertz@ohiolumex.com
Mike Corrigan	mcorrigan@stacktest.us	SES Group 1 SES Group 3	4/1/2015	SES	QSTIprogram@gmail.com
Craig Kormylo	ckormylo@stacktest.us	SES Group 1 SES Group 3	2/5/2016	SES	QSTIprogram@gmail.com
		EPA Method 30B	1/16/2015*	Ohio-Lumex	andrew.mertz@ohiolumex.com
Matthew Parks	mparks@stacktest.us	SES Group 1 SES Group 2 SES Group 3	2/5/2016 9/18/2015 2/5/2016	SES	QSTIprogram@gmail.com

\*The Source Evaluation Society (SES) Group 1 Exam includes EPA Reference Methods 1, 1A, 2, 2A, 2C, 2D, 2F, 2G, 2H, 3, 3B, 4, 5, 5A, 5B, 5D, 5E, 5F, 5I, 17, 19, 201A and 202. The SES Group 2 Exam includes EPA Reference Methods 1, 2, 3, 4, 3B, 6, 6A, 6B, 7, 7C, 7D, 8, 11, 13A, 13B, 15A, 16A, 19, 26, 26A and 202. The SES Group 3 Exam includes EPA Reference Methods 3A, 6C, 7E, 10, 10B, 20, 25A, 40 CFR Part 60 Performance Specifications 2 – 8, 15 and 40 CFR Part 75. Initial 30B training provided by Ohio-Lumex; refresher exam administered by EMCo once every five years.

Please feel free to contact me with any questions regarding the above.



Matthew Parks  
Technical Director